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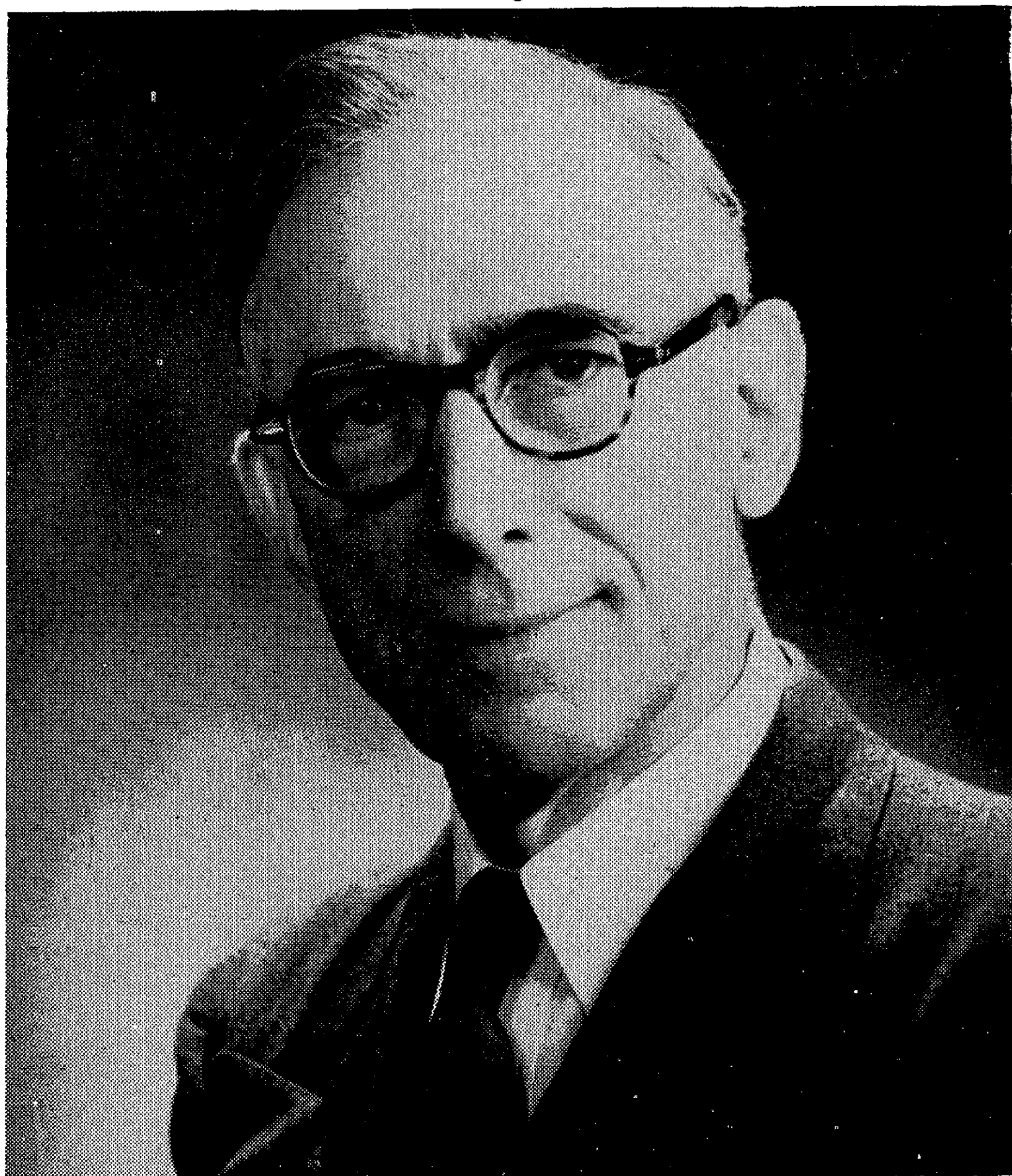
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## EDITORIAL

The Alabama Historical Quarterly is very happy to present in this issue which is Number 2 of Volume 8, this valuable history of the Ordnance Department of the Confederate States Army. This thesis was prepared by Robert Pattison Felgar for the degree of Master of Arts at the University of Texas. A reference to the author's biography will show that he received his Master's degree in 1917 and in 1935 his Ph. D. degree from the same institution.

The Editor.

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ROBERT PATTISON FELGAR

ROBERT PATTISON FELGAR, was born June 10, 1882, at Scottdale, Westmoreland County, Pennsylvania. His parents were Byers and Martha Jane (Hagerman) Felgar. The paternal grandparents were John and Margaret (Boyer) Felgar, of Scottdale, and the maternal grandparents were George and Rebecca Hagerman, of Banning, Fayette County, Pennsylvania. Dr. Felgar's paternal ancestors migrated from Germany and France between 1710 and 1730, to Eastern Pennsylvania. His great-grandfather, Jacob Felgar, was born 1767 and migrated from Eastern Pennsylvania to Westmoreland County in 1790. He belonged to the Federalist Party and was a Colonel of Pennsylvania Militia during the War of 1812. The maternal ancestors of Dr. Felgar left Germany in the Eighteenth Century and settled in Hagerstown, Maryland, and in Pennsylvania.

Dr. Felgar received his early education in the rural schools of Pennsylvania and graduated with the degree of A. B. at the University of Michigan in 1913. He received the M.A. degree from the University of Texas in 1917 and a PH.D degree in 1935, from the same institution. He taught school in Pennsylvania, Michigan, Texas, holding the several positions of principal, head of the Department of History and head of the Department of Economics, Associate Professor of History, Texas State College and instructor in history at the University of Texas. He was head of the Department of History at State Teachers College, Jacksonville, Alabama, 1929-1946, and head of the division of social sciences and of the department of history from 1946, until the present time. He is a Democrat, a Mason and a ruling elder in the Southern Presbyterian Church.

Dr. Felgar was married October 20, 1917 at Austin, Texas, to Martha Etta Oglesby, daughter of John Thomas and Martha Ann (Phillips) Oglesby, of that city. Mrs. Felgar's paternal ancestors migrated from Scotland and England to Virginia and later moved to North Carolina and then to Alabama and later to Mississippi. The maternal ancestors came from Ireland and Scotland to North Carolina, thence to Mississippi and to Texas. The children of Dr. and Mrs. R. P. Felgar are: 1. Robert Pattison, Jr., who married Dorothy Dilts, of Austin, Texas; 2. Martha Jane, who married Capt. W. E. Swenson, Jr., U. S. Army; 3. Thomas Oglesby, of Jacksonville, Ala.

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**THE ORDNANCE DEPARTMENT OF THE CONFEDERATE  
STATE'S ARMY**

**THESIS**

Presented to the Faculty of the Graduate Department of  
The University of Texas

For the Degree of  
**MASTER OF ARTS**

By

Robert Pattison Felgar, B. A.

Austin, Texas

June, 1917

## PREFACE

In the preparation of this thesis the author owes his deepest obligation to Professor Charles W. Ramsdell, under whose direction and supervision the study has been pursued. He acknowledges also the many kindnesses of Mr. E. W. Winkler, of the University Library, who has made possible the use of valuable source material.

R.P.F.

The University of Texas

June, 1917.



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# THE ORDNANCE DEPARTMENT OF THE CONFEDERATE STATES' ARMY

## CHAPTER I

### PRELIMINARY MEASURES TAKEN BY THE CONFEDERATE GOVERNMENT TO OBTAIN ORDNANCE

#### INTRODUCTION

When the Cotton States seced<sup>ed</sup> from the Union, and when their representatives<sup>1</sup> met in convention at Montgomery for the purpose of organizing an independent government, their highest motive was the vindication of their rights in protecting themselves from the oppression of a dominant sectional party. War was not desired, and in the early months of '61 a multitude of Southerners looked upon it as highly improbable. Another multitude looked upon war in a light-hearted manner. They were enthusiastic and exultant in the justice of their cause and in the military ability of their people. The great majority of leading statesmen, and military and naval authorities did not believe that there would be war, and advocated small expenditure on the army and navy.<sup>2</sup> For these reasons little effort was made to procure arms and other ordnance supplies. President Davis, while desiring to avoid war, was the most far-sighted of the Southern leaders in painting out the need of military and naval preparations in anticipation of coercive measures on the part of the North. Referring to the general need of military preparation, in his inaugural address of February 19, 1861, he said:

“An agricultural people, whose chief interest is the export of a commodity required in every manufacturing country, our true policy is peace, and the freest trade which our necessities will permit. . . . For purposes of defense, the Confederate

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<sup>1</sup>Texas seceded February 1, 1861, but delays of travel prevented her delegates from reaching Montgomery until the initial work of the convention had been completed. Phillips, *Life of Robert Toombs*, 222. See also Ramsdell, *Frontier and Secession*, in Dunning: *Studies in Southern History and Politics*, 77-78; *Stats. at Large*, I, 44.

<sup>2</sup>Phillips, *op. cit.*, 232.

States may, under ordinary circumstances, rely mainly upon their militia, but it is deemed advisable, in the present condition of affairs, that there should be a well-instructed and disciplined army, more numerous than would usually be required on a peace establishment."<sup>3</sup>

### 1. First Acts of Congress Concerning War Material.

Following the President's inaugural address the Provisional Confederate Congress passed acts which mildly carried out his policy, but the small appropriations for munitions of war, and the dilatory carrying out of the legislative acts indicate that the possibilities of war were considered remote.

On February 20, 1861, Congress passed an act which authorized the President, or the Secretary of War, under the direction of the President, to make contracts for the purchase and manufacture of heavy ordnance and small arms, and of machinery for the manufacture or alteration of small arms and munitions of war; to employ agents and artisans for these purposes; and to make contracts for the establishment of powder mills, and for the manufacture of powder. The President was to use his judgment in making such contracts.<sup>4</sup>

On February 21, 1861, the War and Navy Departments were established.<sup>5</sup> March 11, 1861, an act was passed which provided for an appropriation of two hundred and fifty thousand dollars for the "armament of fortifications and purchase of light artillery"; for the "purchase, manufacture and alteration of small arms, four hundred and fifty thousand dollars"; and "for ordnance, ordnance stores and supplies, including horse equipments for the regiment of cavalry and for light batteries, one hundred and ninety-nine thousand five hundred and forty dollars."<sup>6</sup> On March 16, 1861, Congress passed "An Act making additional appropriations for the support of the Army, for the year ending the first of March, eighteen hundred and sixty-two,"

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<sup>3</sup>Journal Provisional Congress C. S. A. I, 64-66 Official Records War of Rebellion, Ser. IV, Vol. I, 104-105; Richardson, Messages and Papers of the Confederacy, I, 32-36.

<sup>4</sup>Statutes at Large, C. S. A. I, 28-29. Off. Rec., Ser. IV, Vol. I, 106.

<sup>5</sup>Statutes at Large, C. S. A. I, 32-33; Off. Rec., Ser. IV, Vol. I, 106.

<sup>6</sup>Stat. at Large, I, 59.

and appropriated one hundred and ten thousand dollars "for the purchase of ordnance and ordnance stores."<sup>7</sup>

## 2. The Securing of Federal Arsenals and Munitions Located in the Seceded States.

It was necessarily the policy of the seceding states to take possession of arsenals and arms of the Federal Government which were within their jurisdiction at the time of secession, or to make arrangements with the Washington Government for the taking over of such property. But no provision had been made by the Federal Government for the defense of this property, and despite Lincoln's determination "to hold, occupy, and possess the property and places belonging to the United States," the States of the Confederacy had, by April 1, 1861, taken control of all such property with the exception of Fort Sumter and Fort Pickens. Sumter fell on April 14, 1861, but Pickens maintained itself and remained in Federal hands until the close of the war.<sup>8</sup>

The governments of the seceded states took steps to seize all Federal munitions, arsenals and forts. South Carolina, by December 30, 1860, had possession of all such property with the exception of Fort Sumter.<sup>9</sup> On January 14, 1861, Governor Moore, in a message to the Alabama Convention, declared that he was satisfied that Alabama would not remain in the Union, and deemed it expedient not to wait until the United States Government had thrown troops into Forts Morgan and Gaines at the mouth of Mobile Harbor. He said that he "transmitted orders by telegraph, on the night of ..... January to ....., at Mobile, to take possession of Forts Morgan and Gaines, at the mouth of Mobile Harbor, and of the arsenal at Mount Vernon, with all their arms, ammunition, and equipments, and hold them in the name of the State of Alabama." The governor's orders were carried out the next day, and about one hundred cannon, 32 and 24 -pounder guns in the forts, and in the arsenal about twenty- two thousand stands of small-arms and one hundred and fifty thousand pounds of powder were taken. Of the small-arms about two thousand were Mississippi rifles and

<sup>7</sup>Stat. at Large, I, 88; Off. Rec. Ser. IV, Vol. L, 173.

<sup>8</sup>Rhodes, Hist of United States, III, 355.

<sup>9</sup>Rhodes, op. cit. III, 222.

the remainder muskets. The officers were directed to make out an accurate inventory of the arms and the materials obtained.<sup>10</sup>

In Virginia, steps were taken by the legislature as early as April 1, 1861,—before the attack on Fort Sumter and while Virginia was still in the Federal Union—for the seizure of guns which were manufactured for the Federal Government. A large number of heavy guns, manufactured at the Belona Foundry, near Richmond, had been ordered by the Ordnance Department at Washington, to be sent to Fortress Monroe. The General Assembly passed a joint resolution directing the Governor “to seize and detain said guns for the use of the Commonwealth.” The resolution also provided that the Governor pay Dr. Junius L. Archer, \$7,872.47, the amount due him on his contract for the manufacture of the guns; and pay to the Government at Washington \$13,024.00, which said Government had paid to Archer on account of his said contract.<sup>11</sup>

### 3. Cession of Arsenals and Munitions of the Southern States to the Confederacy.

While the state governments did at times interfere with the machinery of the central government, a disposition was shown on the part of these governments to be willing to cede to the Confederate States the military establishments and munitions within their borders. February 28, 1861, an act was passed by the Confederate Congress which authorized the President “to receive from the several States the arms and munitions of war which have been acquired from the United States, and which are now in the forts, arsenals and navy yards of the said States, and all other arms and munitions which they may desire to turn over and make chargeable to this government.”<sup>12</sup> The Confederate Congress went somewhat further in their resolution of March 15, 1861, which provided

“that the Congress do recommend to the respective States to cede the forts, arsenals, navy-yards and other public establish-

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<sup>10</sup>Message of Governor A. B. Moore to the Alabama Convention, *Off. Rec.*, Ser. IV, Vol. I, 49.

<sup>11</sup>*Off. Rec.* Ser. IV, Vol. I, 203-204.

<sup>12</sup>*Stat. at Large*, I, 43.

ments within their respective limits to the Confederate States, and moreover, to cede so much of the lands reserved heretofore by the government of the United States, or other public vacant lands in their respective limits as may be necessary for timber or lumber for naval or other purposes of public concern; and that the President of Congress be requested to communicate these resolutions and the accompanying report to the governors of the respective States."

The resolution further authorized and empowered the President to take charge of any such property ceded.<sup>13</sup>

In pursuance of the above act and resolution the Secretary of War, proceeded to notify the several State governors the desires of the Confederate Government.<sup>14</sup> April 27, 1861, Secretary of War, Walker, reported to President Davis that each of the States had formally transferred the establishments specified in the resolution of Congress, approved March 15, which recommended to the several states

"To cede to the Confederate States the forts, arsenals, navy-yards, dock-yards, and other public establishments within their respective limits."<sup>15</sup>

After the capture of Fort Sumter had precipitated war and the secession of the border states, the Federal arsenals and munitions in those states were promptly seized and transferred to the Confederacy. On May 11, 1861, the Arkansas Convention passed an act which provided for the appropriation of United States property to the State of Arkansas, and instructed the delegates who were sent to the Provisional Congress of the Confederate States of America to cede and convey to the Confederate Government Fort Smith and all grounds and buildings belonging to the fort; also the arsenal at Little Rock, along with grounds, buildings, and appurtenances.<sup>16</sup> May 21, 1861, the Congress of the Confederacy accepted this property according to the terms of the ordinance of the State of Arkansas.<sup>17</sup> In North

<sup>13</sup>Stat. at Large, I, 94-95.

<sup>14</sup>Off. Rec., Ser. IV, Vol. I, 119, 120, 121.

<sup>15</sup>Walker to Davis, April 27, 1861, Off. Rec., Ser. IV, Vol. I, 249.

<sup>16</sup>Off. Rec., Ser. IV, Vol. I, 312-13.

<sup>17</sup>Off. Rec. Ser. IV, Vol. I, 342.

Carolina, Fort Macon and Fort Caswell were taken and garrisoned, and the Arsenal of Fayetteville was captured before the State seceded on April 21, 1861. Virginia passed her ordinance of secession on April 17, and at once took steps to seize the important arsenal at Harper's Ferry and Navy Yard at Gasport. In this she was only partially successful for the Federals set fire to the armory and arsenal at Harper's Ferry and a large number of arms were burned, while all the vessels except one in the Gasport Navy Yard were fired and scuttled. The Virginia troops, however, succeeded in saving about five thousand improved muskets in complete order, and three thousand unfinished small-arms, and the invaluable machinery for making muskets and rifles; and were able later to Convert the partially destroyed frigate Merrimac into a powerful sea-fighter.<sup>18</sup>

#### 4. Arrangements Made to Secure Materials of War from Northern Establishments.

In accordance with the Act of Congress of February 20, 1861 (previously mentioned) to provide for munitions of war and other purposes, President Davis, on February 21 gave Captain Raphael Semmes, as agent of the Confederate States, elaborate instructions as follows:

"As agent of the Confederate States you are authorized to proceed, as hereinafter set forth, to make purchases and contracts for machinery and munitions, or for the manufacture of arms and munitions of war. Of the proprietor of the Hazard Powder Company, in Connecticut, you will probably be able to obtain cannon and musket powder, the former to be of the coarsest grain, and also to engage with him for the establishment of a powder mill at some point in the limits of our territory. The quantity of powder to be supplied immediately will exceed his stock on hand, and the arrangement for further supply should, if possible, be by manufacture in our own territory. If this is not practicable, means must be sought for further shipments from any and all sources which are reliable. At the arsenal at Washington you will find an artificer named Wright, who has brought the cap-making machine to its present state of efficiency, and who might furnish a cap machine and accompany it to direct its operations. If not in this, I hope you may in

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<sup>18</sup>Pollard, *The Lost Cause*, 121-123.



some way be able to obtain a cap machine with little delay, and have it sent to the Mount Vernon Arsenal, Ala. We shall require a manufactory of friction-primers, and will, if possible, induce some capable person to establish one in our country. The demand of the Confederate States will be the inducement in this as in the case of the powder mill proposed. A short time since the most improved machinery for the manufacture of rifles, intended for the Harper's Ferry Arsenal, was, it was said, for sale by the manufacturer. If it be so at this time, you will procure it for this Government, and use the needful precaution in relation to its transportation. Mr. Barbour, the superintendent of the Harper's Ferry Armory, can give you all the information in that connection which you may require. Mr. Ball, the master armorer at Harper's Ferry, is willing to accept service under our Government, and could probably bring with him some skilled workmen. If we get the machinery this will be important. Machinery for grooving muskets and heavy guns, with persons skilled in their use, is, I hope, to be purchased ready-made. If not, you will contract for their manufacture and delivery. You will endeavor to obtain the most improved shot for rifled cannon, and persons skilled in the preparation of shot and other fixed ammunition. Capt. G. W. Smith and Captain Lovell, late of the U. S. Army, and now of New York City, may aid you in your task; and you will please say to them that we would be happy to have their services in our army. You will make such inquiries as your varied knowledge will suggest in relation to the supply of guns of different calibers, especially the largest. I suggest the advantage, if to be obtained, of having a few of the 15 inch guns like the one cast at Pittsburg. I have not sought to prescribe so as to limit your inquiries, either as to object or place, but only to suggest for your reflection and consideration the points which have chanced to come under my observation. You will use your discretion in visiting places where information of persons or things is to be obtained for the furtherance of the object in view. Any contracts made will be sent to the Hon. L. P. Walker, Secretary of War, for his approval, and the contractor need not fear that delay will be encountered in the action of this Government."<sup>10</sup>

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<sup>10</sup>President Davis to Captain Semmes, February 21, 1861; *Off, Rec.*, Ser. IV, Vol. I, 106-107; Davis, *Rise and Fall of Confederate Government*, I, 311-313.

Captain Semmes was, however, only partially successful. Part of the munitions contracted for came South through the ordinary channels of commerce for a few weeks, but naturally this soon ceased before any important results had been obtained. On the other hand, he was able to supply the War Department with drawings for a bullet-pressing machine and other valuable information. He was surprised to find the Tredegar Foundry at Richmond "so large and well-appointed an establishment." He stated that it had great facilities for founding cannon, and casting shot and shell, and being on slave territory, would be a great resource for the South if put upon her defense.<sup>20</sup>

During the month of March and the early days of April, 1861, the Honorable John Forsyth, as agent for the Confederacy, was negotiating for a disbursing clerk from the United States War Department, and for the purchase of arms and ammunition from the Hazard Powder Factory in Connecticut. Powder and arms were contracted for by Forsyth with this factory, and ordered by Secretary of War, Walker, to be delivered, but there are no records to show that such delivery was made.<sup>21</sup>

On the whole, the efforts made by agents of the Confederate States to obtain munitions from Northern establishments were futile as to results, and the South was compelled to rely upon supplies from abroad, upon those which were in her possession at the outbreak of war, and upon those which she manufactured during the war;<sup>22</sup> but the "secret-service" work on the part of Captain Louis Zimmer of Virginia deserves consideration in this connection.

Having been commissioned by Governor Letcher of Virginia for secret service duty, Captain Zimmer received orders, on March 4, 1861, from Commodore Maury, a member of the Governor's special council of war, to proceed to New York to purchase 1,000,000 percussion caps for the use of the army of

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<sup>20</sup>Semmes to Walker, February 28, 1861; Off. Rec. Ser. IV, Vol. I, 118-19; Gorgas, "Notes on the Confederate Ordnance Department," So. Hist. Soc. Pap. XII, 70; Mallet, "Work of the Ordnance Bureau," So. Hist. Soc. Pap. XXXVII, 2.

<sup>21</sup>Off. Rec., Ser. IV, Vol. I, 125, 165, 210, 213, 216, 217.

<sup>22</sup>Off. Rec. Ser. IV, Vol. I, 292-293; Walker to Cobb, May 7, 1861; Schwab, J. C., *The Confederate States of America*, 268-269; Fleming, W. L., *Civil War and Reconstruction in Alabama*, 149-150.

Virginia. Without going into a detailed narrative of this episode, it is significant to note that after many hair-breadth escapes and adventures, Captain Zimmer delivered to the Governor of Virginia 800,000 percussion caps. During the early days of July these indispensable munitions of war were delivered to the Confederate army. Without these munitions the Battle of Manassas could not have been fought, and the Southern army, after a few hours of resistance could have been forced to retreat on Richmond. Thus through the energetic and patriotic services of an unassuming Captain of the Virginia Ordnance Department the victory for the Confederate arms on the field of Manassas was made possible.<sup>23</sup>

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<sup>23</sup>From the Richmond, Va., Dispatch, Oct. 21, 1900. In *So. Hist. Soc. Pap.* XXVIII, 14-18.

## CHAPTER II

ORGANIZATION OF THE ORDNANCE DEPARTMENT AND  
THE PROBLEMS WHICH CONFRONTED IT1. Organization-Appointment of Major Josiah Gorgas Chief of  
Ordnance.

Following the deception of the Commissioners of the Confederate Government by the authorities at Washington, the probability of war was much stonger, and the Confederacy made additional preparations for the impending conflict.<sup>24</sup> On April 8, 1861, Major Joshiah Gorgas,<sup>25</sup> was appointed by President Davis

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<sup>24</sup>Pollard, *op. cit.* 108; Davis, *Rise and Fall of the Confederate Government*, I, 296.

<sup>25</sup>Major (later General) Josiah Gorgas was born in Duphin County, Pennsylvania, July 1, 1818. He entered the United States Military Academy at West Point July 1, 1837, and graduated No. 6 in the class of 1841. His high rank in his class entitled him to a position in the Engineer or Ordnance Departments, and he was immediately placed on duty as an ordnance officer, and served in this capacity until 1845, when he was granted a leave of absence in order that he might go to Europe to pursue his profession and examine the arms and arsenals abroad. In 1846 he returned to Watervliet Arsenal as assistant ordnance officer.

He was in active service in the Mexican War, and on March 3, 1847, he was promoted to First Lieutenant. He served with distinction in the siege of Vera Cruz, and when this city was occupied by the United States forces he was placed in charge of the ordnance depot there. When the war closed he returned to Wartervliet Arsenal as assistant ordnance officer, and served there and at other arsenals until 1853, when he was placed in command of the Mount Vernon Arsenal in Alabama. His official duties carried him frequently to Mobile, where he was occasionally the guest of ex-Governor John Gayle. Here he made the acquaintance of the ex-Governor's daughter, Miss Amelia Gayle, to whom he was married in December, 1853.

In 1855, he was made captain of ordnance; in 1856, he was transferred from Mount Vernon Arsenal to the command of the Kennebec Arsenal, Maine; in 1858, he was ordered to command the arsenal at Charleston, South Carolina; in 1860, he was transferred to the command of the Frankford Arsenal, near Philadelphia; in October, 1860, he was selected as a member of the Ordnance Board, and served as such until December 28, 1860; and in April, 1861, he resigned from the United States service. As he was ardently attached to the Union of the States, and much devoted to the officers of his corps and to the army, this resignation was the most painful act of his life; but he believed that the South was just in her cause, and he knew that she was weak.

After resigning he moved with his wife and children to Alabama, and was invited by President Davis to accept the position of Chief of

as Chief of Ordnance.<sup>26</sup>

The existence of the Ordnance Department or Ordnance Bureau may be said to date from the time of the appointment of Major Gorgas as chief. It was never organized by law,<sup>27</sup> but was, on December 16, 1864, recognized as being organized under the forty-fourth article of the "Regulations of the Army," and had before that time been repeatedly referred to in legislation as existing.<sup>28</sup> Thus when President Davis appointed Major Gorgas Chief of Ordnance, his only authorization for this was implied in the Act of March 6, 1861, providing for the "establishment and organization of the Army of the Confederate States of America." Section 5 of this act made the corps of artillery responsible for ordnance duties, while section 12 authorized the President to appoint officers.<sup>29</sup> The detailed organization of the department, and its successful operation under very adverse circumstances developed upon Major Gorgas.<sup>30</sup>

## 2. Conditions under which the Ordnance Department began its work.

The difficult task which confronted Major Gorgas may be best understood through a consideration of the arms, ammuni-

Ordnance of the Southern Confederacy. This position he held most credibly until the close of the war, having been promoted to the rank of general.

At the close of the war, General Gorgas returned to Alabama where he was made Superintendent of the Briarfield Iron Works. While here he was appointed Head Master and later Vice-Chancellor of the University of the South at Sewanee, Tennessee. In 1877 he was made President of the University of Alabama, but on account of failing health he resigned. In recognition of his services, the trustees made him librarian and Mrs. Gorgas matron, and provided a home for them. Here on May 15, 1883, General Gorgas died.

So. Hist. Soc. Papers, XIII, 216-28.

It is gratifying to note that General Gorgas was survived by an able son, General William Srawford Gorgas, who rose to the position of Surgeon-General of the United States' Army.

<sup>26</sup>Special Orders, No. 17, Off. Rec. Ser. IV, Vol. I, 211.

<sup>27</sup>Off. Rec., Ser. IV, Vol. III, 943-4.

<sup>28</sup>Seddon to Davis, Dec. 16, 1864, Off. Rec., Ser. IV, Vol. III, 943-4; Army Regulations C. S. A., 286; General Orders from Adjutant and Inspector-General's Office, Confederate States' Army, 28-29.

<sup>29</sup>Stat. at Large, C. S. A., I, 48-49; Off. Rec., Ser. IV, Vol. I, 128-30.

<sup>30</sup>A Sketch of the Life of General Gorgas, So. Hist. Sec. Pap. XIII, 217-228.

tion, facilities for their manufacture, and the armies to be supplied. On April 8, 1861, there were located in the Confederate States the following small arms:—

	Rifles	Muskets
At Richmond, Va. (about .....	4,000	.....
Fayetteville Arsenal, N. C. (about) .....	2,000	25,000
Charleston Arsenal, S. C. (about) .....	2,000	20,000
Augusta Arsenal, Ga. (about) .....	3,000	28,000
Mount Vernon Arsenal, Ala. ....	2,000	20,000
Baton Rouge Arsenal, La. ....	2,000	27,000
	<hr/>	<hr/>
	15,000	120,000

In addition there were at Richmond about 60,000 old worthless flint muskets, and at Baton Rouge about 10,000 old Hall's rifles and Carbines. Also, there were at Little Rock, Arkansas, a few thousand stand of arms, and some at the Texas arsenals; and to these there must be added the arms owned by the several States, and by the military organizations throughout the country, giving about 150,000 small arms in all for the use of the armies of the Confederacy. The rifles were of .54 caliber, and known as Mississippi rifles, except those at Richmond, taken from Harper's Ferry, which were of .58 caliber; the muskets were the old flint-lock, caliber .69, altered to percussion. A few boxes of sabres were at each arsenal, and some short artillery swords. Here and there were scattered a few hundred holster pistols, but there were no revolvers.<sup>31</sup>

Very little powder or ammunition were stored in the South, and this was a relic of the Mexican War and was stored principally at the Baton Rouge and Mount Vernon arsenals. It is doubtful if there were a million rounds of small arms cartridges in the Confederacy. There was no lead in store, and the stock of percussion caps did not exceed one-quarter of a million. The chief supply of powder was that captured at Norfolk, and this combined with that previously mentioned would amount to about 60,000 pounds, chiefly old cannon powder.<sup>32</sup>

<sup>31</sup>Gorgas, Notes on the Ordnance Department of the Confederate Government, So. Hist. Soc. Pap., XII, 68; Davis, Rise and Fall of the Confederate Government, I, 471.

<sup>32</sup>Gorgas, 68; Davis, op, cit. I, 472.

None of the Southern arsenals contained batteries of serviceable field artillery, except a battery of four six-pounder guns, and two twelve-pounder howitzers at Fayetteville, N. C., which became the property of the Confederacy after the secession of North Carolina.<sup>33</sup> These, in addition to a few old iron guns, mounted on Gribeauval carriages, fabricated about the time of the War of 1812, composed practically the entire stock of Confederate cannon. There were, however, a few serviceable batteries which belonged to the States and to volunteer companies; but there were neither harness, saddles, bridles, blankets, nor other artillery or cavalry equipments.<sup>34</sup> A number of heavy sea-coast guns were located at the fortified ports, and others were seized on board men-of-war at the time of the secession of Virginia.<sup>35</sup>

Early in May, 1861, there were in the Confederate armies on both sides of the Mississippi one hundred and fifty thousand men; and for these there were on hand no infantry accoutrements, no cavalry arms or equipments—no artillery, and, above all, no ammunition, nothing save small arms, and those were almost wholly smooth-bore altered from flint to percussion.<sup>36</sup>

Such arsenals as existed within the limits of the Confederate States had been used only as depots, and were not used to construct materials of war, and only one, that at Fayetteville, North Carolina, had a single machine above a foot-lathe. Except at Harper's Ferry Armory all the work of preparation of iron material had been carried on at the North. No arms, guns, gun carriages, and scarcely a round of ammunition—except during the Mexican War—had, for fifty years, been prepared in the Southern States. Consequently, there were few or no workmen skilled in these arts. No powder, save perhaps for blasting, had been made in the South, while there was no saltpetre on hand at any point, as it was stored wholly in the North. The only lead mines within the limits of the Confederacy were in Virginia near the Federal border, and this situation made the securing of lead precarious. The only cannon foundry was

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<sup>33</sup>Captain Graham Daves, *Artillery at the Southern Arsenals*, So. Hist. Soc. Pap., XII, 360.

<sup>34</sup>Gorgas, 68; Davis, I, 472.

<sup>35</sup>Mallet, *Work of the Ordnance Bureau*, So. Hist. Soc. Pap. XXXVII, 1.

<sup>36</sup>Gorgas, XII, 68-69; Davis, I, 472.



located at Richmond. Copper, so necessary for field artillery and for percussion caps, was just being produced in East Tennessee. The few blast furnaces were small, and with trifling exceptions were located in the border States of Virginia and Tennessee. There was no rolling-mill for bar iron south of Richmond.<sup>37</sup>

### **3. Refutation of the Accusation Against Secretary of War Floyd for the Unauthorized Transference of Arms to the South.**

,During the war, in after years, and even at the present time, John B. Floyd, of Virginia, as Secretary of War under President Buchanan, has been charged with traitorously abusing his office by sending arms to the South just before the secession of the States.

"For years the accusation clung to Secretary Floyd that he had improperly and fraudulently supplied the South with these muskets, and 'the story of the stolen arms' was perpetuated in every variety of Yankee publication."<sup>38</sup>

The facts conclusively prove that the transaction which gave rise to this accusation were in the ordinary course of an economical administration of the War Department, for after the authorities had determined to change the old flint-lock musket, which the United States possessed, to percussion, it was deemed cheaper to bring all the flint-lock arms in store at Southern arsenals to the Northern arsenals and armories for alteration, rather than to send the necessary machinery and workmen to the South.

"Consequently the Southern arsenals were stripped of their deposits, which were sent to Springfield, Watervliet, Pittsburgh, St. Louis, Frankfort, Pa., and other points. After the conversion had been completed the denuded Southern arsenals were again supplied with about the same numbers, perhaps slightly augmented, that had formerly been stored there. The quota deposited at the Charleston arsenal, where I was stationed in 1860, arrived there a full year before the opening of the war."<sup>39</sup>

Pollard, in his work, "The Lost Cause," makes in substance, the same statement as General Gorgas, and in addition makes

<sup>37</sup>Gorgas, 69; Davis I, 472-73.

<sup>38</sup>Pollard, *The Lost Cause*, 132; See Gorgas, XII, 93.

<sup>39</sup>Gorgas, 93.



reference to a distribution of rifles and muskets in 1860, as follows:

"Again, in 1860, the aggregate of rifles and muskets distributed was 10,151, of which the Southern and Southwestern States received only 2,849, or between **one-third and one-fourth of the whole number**. It thus appears that the Southern and Southwestern States received much less in the aggregate, instead of more than the quota of arms to which they were justly entitled under the law for arming the militia. Could the force of misrepresentation further go than to torture from these facts the charge that Mr. Buchanan's Secretary of War had fraudulently sent public arms to the South for the use of the insurgents! Yet this is but one example of that audacity and hardly persistence in falsehood displayed in all Northern publications during the War."<sup>40</sup>

In justice to the United States Congress it is deemed fitting to note that as result of the extensive circulation of the accusation against Mr. Floyd, a committee of the House of Representatives was named in January, 1861, to make an investigation. Mr. Stanton, Chairman of this committee, was one of the most respected members of the Republican Party in the House. The report of this committee completely exonerated Mr. Floyd, and refuted the calumny. The slander, however, continued to be circulated and believed—"while the refutation, although

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<sup>40</sup>Pollard, *op. cit.*, 132. See Johnston, *Narrative of Military Operations*, 426-29. Davis, I, 482. *Transfer of Arms*.

Pollard in his work, "The First Year of the War", made a statement which has been refuted in the above. The statement is as follows:

"It had been supposed that the Southern people, poor in manufactures as they were, and in the haste of preparation for the mighty contest that was to ensue, would find themselves but illy provided with arms to contend with an enemy rich in the means and munitions of war. This disadvantage had been provided against by the timely act of one man. Mr. Floyd, of Virginia, when Secretary of War under Mr. Buchanan's administration, had by a single order effected the transfer of 115,000 improved muskets and rifles from the Springfield Armory and Watervliet arsenal to the different arsenals at the South. Adding to these the number of arms distributed by the Federal government to the States in preceding years of our history, and those purchased by the States and citizens, it was safely estimated that the South entered upon the war with one hundred and fifty thousand small-arms of the most approved modern pattern and the best in the world." Pollard, *The First Year of the War*, 67-68.

by such a body, was unnoticed—and, I believe, is now forgotten.”<sup>41</sup>

The essential facts in the report of this committee are in accord with the statements made by General Gorgas and Mr. Pollard.<sup>42</sup>

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<sup>41</sup>Johnston, 427. For an account of the work of this committee see Rhodes, *History of U. S. Since 1850*, III, 238-241.

<sup>42</sup>Johnston, 428. See (above) Gorgas and Pollard.

## CHAPTER III

## THE WORK OF THE ORDNANCE DEPARTMENT

## 1. Available and Temporary Establishments.

## A. The Supply of Powder

The problem of supplying powder to the armies in the field demanded immediate attention. The opening of hostilities and the blockade of the Southern ports checked the importation from the North for which previous contracts had been made. Thus it was very imperative that steps be taken at once to supply this much needed article.

The necessary ingredients for the manufacture of powder are saltpeter, charcoal, and sulphur. The proportion of each may vary, but the following is a conservative recipe: saltpeter seventy-five parts, charcoal fifteen parts, and sulphur ten parts. In order to obtain the saltpeter it was necessary to secure niter from the earth and to extract saltpeter from the niter.<sup>43</sup> Niter was at once sought for in North Alabama and Tennessee,<sup>44</sup> while large quantities of sulphur, stored in New Orleans to be used in sugar-refining, were secured, the entire stock amounting to four or five hundred tons.<sup>45</sup> Charcoal was obtained from cottonwood, willow, dogwood, and other woods.<sup>46</sup> President Davis urged the erection of a large powder-mill, and about the middle of June, 1861, he directed Major Gorgas to detail an officer to select a site and begin the work. The day following this order Major G. W. Rains, a graduate of West Point and qualified in every way for this service, was appointed for this task. He had arrived in Richmond by breaking through the blockade and at once set out under written instructions from Major Gorgas. Major Rains went first to East Tennessee to supervise and systematize the operations of two small private mills, which were at work for the State of Tennessee. At this time there was on hand about 250,000 pounds of powder, chiefly cannon powder, and about the same amount of niter which had been imported

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<sup>43</sup>The History of the E. I. du Pont de Nemours Powder Company, 8; International Encyclopedia (1915) X, 488.

<sup>44</sup>Gorgas, *loc. cit.*, 69; Fleming, *op. cit.*, 152; Davis, I, 473.

<sup>45</sup>Gorgas, *loc. cit.*, 70; Davis, I, 473.

<sup>46</sup>Fleming, 152; Mallet, *loc. cit.*, 10.

chiefly by the State of Georgia. Thus the South had, about June 1, 1861, two small powder-mills, and had no men with experience in making powder or in obtaining niter. All had to be learned.<sup>47</sup>

Nevertheless, Secretary Walker reported to Congress, on July 31, 1861, in part as follows:

"Preparation for the manufacture of powder within the limits of the Confederate States are progressing on a large scale. The Government is in possession of large quantities of sulphur and saltpeter, and it is hoped that it will not be long before the Confederate States will be independent of foreign supplies in this important munition of war. The arrangements made in Europe for the purchase of powder are believed to be complete and satisfactory. A large quantity has been already purchased, which will be ready for early shipment, and arrangements have been made for its importation which it is confidently hoped will elude the utmost vigilance of the blockade."<sup>48</sup>

The extent to which the hopes of the War Department were realized can be obtained from a consideration of the progress made in the manufacture of powder during the summer and autumn of 1861. Under the able and energetic supervision of Major Rains the materials for the manufacture of powder were produced, the existing establishments which were capable of making powder were put in operation and others were established. In the course of the summer of 1861 Major Rains established a refinery of saltpeter near Nashville, and to this place was sent chiefly the niter obtained from Georgia and from the caves in East and Middle Tennessee. This niter supplied the two powder mills of Tennessee and good powder was produced.<sup>49</sup> A small portion of the Georgia niter was sent to the Pendleton and Walhalla mills, two small establishments in South Carolina, where a powder was produced, inferior at first, but improved later. Near Raleigh, North Carolina, a mill was established by the State under contract with certain parties to whom the state was to furnish the niter, of which a large part

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<sup>47</sup>Gorgas, *loc. cit.*, 70; Davis, I, 473. See Walker to Cobb, May 7, 1861, *Off. Rec. Ser. IV*, Vol. I, 292-3.

<sup>48</sup>Walker to Howell Cobb, Pres. of C. S. Congress, Richmond, July 31, 1861. *Off. Rec.*, Ser. IV, Vol. I, 510.

<sup>49</sup>Gorgas, 72; Schwab, 270.

was derived from the caves in Georgia. Near New Orleans, Louisiana, a stamping mill was put up, and powder was produced until the fall of the city. Small quantities of powder, some of it of a very inferior quality, were received through the blockade along the coast from Wilmington to Galveston.<sup>50</sup>

On July 27, 1861, Congress passed a resolution which propounded to the secretary of war a number of interrogatorials concerning the work of the Ordnance Department. Concerning the quantity of powder, sulphur, and saltpeter on hand, Major Gorgas, on August 12, 1861, reported that the cannon-powder on hand was chiefly at the several ports on the sea-coast, and was sufficient for the present wants of the sea-board defenses, and that about 200,000 pounds of musket and rifle powder were on hand; that three hundred tons of sulphur were at the disposal of the Government, equal to the production of 3,000 tons of powder; that two hundred and forty tons of saltpeter were in possession of the State of Georgia, purchased and ready to be turned over to the Confederate States, a part of which had already been turned over.<sup>51</sup>

In reply to that part of the resolution which made inquiry as to what measures had been taken to procure powder, sulphur, and saltpeter, Major Gorgas replied:

**"Powder.**—Orders have been given to Messrs. Bowen and Co., near Pendleton, S. C., to furnish all their mill makes, and saltpeter has been supplied to them, they having sulphur enough for four to six tons of powder. The like order has been given to J. M. Ostendorff, Walhalla, S. C., and saltpeter and sulphur ordered to his mills. These two mills will make about 300 pounds a day together. General Davis, near Lewisburg, Va., has lately been supplied with a small quantity of sulphur, and he is now making powder for our troops, as he states. Two mills near Nashville, Tenn., are preparing to make powder. Of these S. D. Morgan, esq., of Nashville, under date of August 3, says: 'One of our mills has( as I have just learned, commenced operations on an extended scale, and another, still more extensive will be ready to operate next month, as the proprietor assures me.' An order

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<sup>50</sup>Gorgas, 72; Davis, I, 474.

<sup>51</sup>Off. Rec., Ser. IV, Vol. II, 555.

has been given to C. D. Yale, of this state, for 250 tons of powder, to be furnished at 40 cents per pound. Orders have also been sent abroad to purchase 2,500,000 pounds, and to a party to purchase 650,000 pounds in Mexico."

**"Sulphur.**—An order was given to Doctor Ullmann, of Tallapoosa, Ala., to furnish sulphur, which he undertook to make at the rate of from 1,000 to 2,000 pounds per day. His success has not yet been reported. Efforts will be made, under the stimulation of high prices, by various parties, to procure this ingredient from the iron pyrites, and it will eventually be thus obtained, quite as soon as required."

**"Saltpeter.**—An order was given in May last to Messrs. Leonard & Riddle, at Montgomery, for 60,000 pounds, and they at once entered on the labor of getting it out; with what success I have not yet learned. Mr. Leonard was the contractor on the Pensacola Railroad. An officer of the Department has been directed to visit these works and report upon them, as also those of Doctor Ullmann, for getting sulphur. An order was also given to Colonel Hindman, of Arkansas, to deliver 100,000 pounds at Memphis about the same time, but nothing has been heard from him. Mr. Richard Ross, of Tennessee, has taken an order for fifty tons, to be gotten from the caves of East Tennessee. In reference to the caves of East Tennessee and North Alabama, Mr. Sholer Smith, agent of the State of North Carolina, writes: 'Messrs. Nelson and Davis, of Philadelphia, Monroe County, writes that they have their cave in full operation, and some 6,000 or 8,000 pounds of material on hand for sale, and await an offer. They are now open to contracts. A party in Fentress County is also ready to supply some three or four tons per month. William Worley, of Cave Springs, Carter County, needs but assurance of a contract to go to work in his section, which is rich in niter. Of the North Alabama caves none have proved profitable except those of S. D. Boren and Company, who are making 700 pounds per day on a contract with the State of Tennessee. They offer us three tons per month at 35 cents per pound; postoffice, Larkinsville, Ala. The specimens sent by this firm are very pure. The prices paid by Tennessee range from 22 to 30 cents per pound.'

"An ample supply of niter (three or four tons per week) can be obtained in East Tennessee, but it is necessary that an agent

should be sent there before the interest in this matter subsides to stir them up to the work. Mr. Smith stated verbally that there were various parties at the caves he had visited who had taken out 8,000 to 10,000 pounds, and stood ready to sell it. I directed him to say to all said parties that the Bureau would pay for it, delivered at the nearest railroad station, on railroad receipts, at the rate of 25 cents per pound.<sup>52</sup>

While energetic efforts were made to manufacture powder and to import it from abroad, it was not possible during the first year of the war to meet the demand. It has been estimated that on January 1, 1862, there were 1,500 sea-coast guns of various calibres in position from the Potomac to the Rio Grande. Averaging the calibre of the guns at thirty-two pounders, the charges at five pounds, and the number of rounds at forty per gun, would require 600,000 pounds of powder. Three hundred pieces of field-artillery with two hundred rounds each would require 125,000 pounds, while 10,000,000 small arm cartridges would consume 125,000 pounds more—in all 850,000 pounds. Deducting the 250,000 pounds, supposed to be on hand at the beginning of the war, there remains 600,000 pounds. About 200,000 pounds of this had been made at the Tennessee and other mills, leaving 400,000 pounds to be supplied through the blockade.<sup>53</sup> The latter source did not prove adequate to meet the demand, and the Department was not able to supply the ammunition required until after the government powder-mills at Augusta went into operation in the autumn of 1862.<sup>54</sup>

### B. The Supply of Small Arms

The manufacture of small-arms in the Confederacy was made possible largely through the heroic work of the operations of the Harper's Ferry Armory. Before the Federal soldiers left they set fire to the armory, but the employees, in charge of the master armorer, Mr. Ball, succeeded in saving the machinery and almost the entire stock of arms. The machinery secured consisted of two sets, one set for the making of the rifle musket, the other for the rifle with the sword payonet. The machinery for making the rifle musket was transferred to

<sup>52</sup>Off. Rec., Ser. IV, Vol. I, 555-556.

<sup>53</sup>Gorgas, 73.

<sup>54</sup>Gorgas, 75.



the Virginia arsenal at Richmond, while that for making the rifle with the sword bayonet was sent to Fayetteville, North Carolina, by consent of the State of Virginia. Under the direction of Lieutenant-Colonel Burton, an officer in the service of Virginia, and one whose experience in the armories of the United States and in the erection of the works at Enfield, near London, well qualified him for the position, the machinery was put in operation. Both the Richmond and Fayetteville arsenals were provided with steam power, and were capable together of producing 2,000 to 2,500 stands of arms per month. It was not possible to use more than one set of hands as workmen could not be obtained, and it took time to put the machinery in working order. These, then, were the only prospective resources for such work at home as the South contained no private armories prior to the war, and no inducement had been made to turn capital in that direction. This accounts for the lack of skilled operatives. Later, through the aid of money and encouraged by the sympathy of patriotic citizens the Brothers Cook in New Orleans embarked in the business of making small arms.<sup>55</sup>

In his answer of August 12, to the previously mentioned inquiries of the Confederate Congress, Colonel Gorgas had this to say concerning the production of small-arms:

“Very few arms have yet been manufactured for the Government either at private or public establishments for a very obvious reason—there has not yet been time to get up establishments for this purpose. A few—eight or ten per day for four or five weeks past—it is reported, have been made out of the gun-barrels saved from Harper’s Ferry, at Wytheville, for the command of General Floyd. An order for 30,000 stand of arms has been given to Messrs. McIlwain & Co., Holly Springs, Miss., the first delivery on which is to be made November 1, and thereafter at the rate of 2,000 per month. Mr. Le Mat, of Louisiana, has an order to deliver 5,000 of his revolvers. Mr. Ed. Want, of New Berne, N. C., has an order for the delivery of 5,000 pistols, to begin in three months. Orders are out also for the manufacture of 4,000 swords and 3,000 saber-bayonets. Unlimited orders have also been given in Mexico and in Cuba. None have yet been received by this Department. The armory at this place

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<sup>55</sup>Gorgas, 70-71. See Mallet, 2. See Davis, I, 473, also Burton to Gorgas July 20, 1861, *Off. Rec.*, Ser. IV, Vol. I, 509-510.



will probably be in working order in six or eight weeks. That at Fayetteville where some new buildings must be erected, will not be ready for four months. The Department has received from its agents in Europe for the purchase of arms positive information as to the purchase by them of arms, embracing muskets and rifles chiefly, to the amount of \$300,000, and also assurances that they will be shipped through in safety. We therefore look forward with confidence to their early arrival."<sup>56</sup>

In the autumn of 1861, arms began to come from Europe, but the armies were still greatly hampered on account of the large numbers of unarmed men. In order to provide these men with weapons of some kind the Confederate arsenals resorted to the manufacture of pikes for the infantry and lances for the cavalry. Many thousands of pikes were made, but were little used,<sup>57</sup> although Congress by an act of April 10, 1862, authorized the President to organize companies, battalions, or regiments of troops and arm them with pikes. Such troops were, however, to receive fire-arms in case such arms should become available as result of vacancies from death, discharge, or sickness. In this way, every fire-arm would be in the hands of an effective man.<sup>58</sup>

That large numbers of soldiers in the armies on exposed fronts were still unarmed at the beginning of the second year of the war is illustrated by the following letter:

Headquarters, Richmond, April 9, 1862.

"Colonel: General Jackson has with him some 1,000 or 2,000 men without arms, and has requested that pikes be sent him. I have the honor to request that, if practicable, you will cause, say 1,000 pikes to be forwarded to him via. Staunton.

R. E. Lee."<sup>59</sup>

The States, too, made heroic efforts to meet the shortage of arms. In 1861, the State of Alabama bought one thousand pikes and one hundred bowie knives to arm the militia who were defending Mobile.<sup>60</sup>

<sup>56</sup>Off. Rec., Ser. IV, Vol. I, 556.

<sup>57</sup>Gorgas, 74.

<sup>58</sup>Off. Rec., Ser. IV, Vol. I, 1053.

<sup>59</sup>Lee to Gorgas, Off. Rec., Res. I, Vol. XII, Part III, 844.

<sup>60</sup>Fleming, op. cit., 150.

### C. The Supply of Artillery

In the early months of the war dependence for heavy artillery was mainly upon guns located in the forts of the South. Major Gorgas, on April 20, 1861, reported 375 sea-coast guns in the forts, 54 guns of similar style in the arsenals, while 35 pieces of field artillery were stored in forts.<sup>61</sup> The manufacture of field artillery at this time and later was confined chiefly to the Tredegar works at Richmond, although at Nashville the Ordnance Department of Tennessee was turning its attention to the manufacture of field and seige artillery. Noble & Son, owners of a foundry at Rome, Georgia, were induced to undertake the casting of three-inch rifles, after drawings furnished from Montgomery. The progress, however, was slow. A number of old four-pounder iron guns, owned by the state of Virginia, were reamed out in order to get a good bore, and were rifled with three grooves somewhat like the parrott gun. The artillery equipment of the army in observance at Harper's Ferry and at Manassas consisted of batteries composed of six-pounder guns and twelve-pounder Howitzers, while Magruder at Big Bethel had a few Parrott guns which had been purchased by the State of Virginia.<sup>62</sup>

By January, 1862, the following arsenals and depots, under the control of the government, were in operation: Augusta Arsenal, Augusta, Georgia; Charleston Arsenal, Charleston, South Carolina; Fayetteville Arsenal and Armory, Fayetteville, North Carolina; Tredegar Works (Armory) Richmond, Virginia; Richmond Arsenal, Richmond, Virginia; Savannah Depot, Savannah, Georgia; Nashville Arsenal, Nashville, Tennessee; Memphis Depot, Memphis, Tennessee; Mount Vernon Arsenal, Mount Vernon, Alabama; Baton Rouge Arsenal, Baton Rouge, Louisiana; Montgomery Depot, Montgomery, Alabama; Little Rock Arsenal, Little Rock, Arkansas; San Antonio Arsenal, San Antonio, Texas.<sup>63</sup>

### 2. The Establishment Of Large Permanent Arsenals, Armories, and Laboratories.

While the immediate needs of the armies were supplied as far as possible by the equipping, erecting, and operating of the

<sup>61</sup>Off. Rec., Ser. IV, Vol. I, 228-229.

<sup>62</sup>Gorgas, 71-72.

<sup>63</sup>Gorgas, 74. See Off. Rec., Ser. IV, Vol. I, 991.

small establishments named, and by the erecting of others to meet emergencies, projects were begun for the constructing of works which would enable the Department to concentrate the manufacture of munitions and produce them on a large scale.

The erection of a first class powder mill was the first of the permanent works undertaken, and upon Major G. W. Rains devolved the task of building and equipping this mill. Following the report of Major Rains, the site of this mill was fixed near Augusta, Georgia, where work was begun in September, 1861.<sup>64</sup> In the meantime Major Rains had been busy making arrangements for the manufacture of the machinery necessary for the operation of the projected plant. The difficulties of his task are best described in his letter of July 25, 1861, to Major Gorgas:

"In relation to the Government factory, I have to state that the drawings of the machinery are now being made at Nashville, and on my return the work will at once be commenced. I have visited the iron-works and machine-shops at Nashville, Chattanooga, Atlanta, Augusta, and on my return will be so at Rome. I found that I could procure some of the lighter work at Nashville, and at Chattanooga a portion of the heavy castings can be made; but as they will have to complete first the work of the Manchester Powder Mills, it will be some twenty-five or forty days before being able to commence the Government works. At Augusta some of the lighter work can also be constructed, and perhaps also at Rome. At Atlanta a portion of the heavy castings can be made, having about the same capacity as at Chattanooga for such work. Thus these two are the only ones which have the necessary tools to do large work. Having to wait for the latter iron-works to complete their present job, it will take over four months to get the rolling cylinders for the mills made at these places for making two tons of powder per day; hence I shall be compelled to get the Tredegar works to assist in their manufacture, as it will take not less than forty rolling cylinders (or twenty mills) to manufacture five tons of powder each twenty-four hours, and this is the desired capacity for the factory, if I understand you correctly. Of course the making of powder would commence as soon as one set of machinery could be completed without waiting for the rest, but all the apparatus necessary for the whole, such as making charcoal, refining niter,

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<sup>64</sup>Mallet, 3-4; Gorgas, 73 .

refining sulphur, breaking coke, pressing, granulating, dusting, pulverizing, glazing, etc., with drying-houses for wood and powder, as also all the buildings to contain the same, and magazines would have to be constructed before the manufacture could commence. Thus, with all the facilities which can be had, even with the aid of the Tredegar Works, and working night and day, it will take at least three months before any of the machinery can be put into operation. I was fortunate to find two good steam engines, of 80 horse power each, with boilers and fixtures complete at Atlanta (second hand), which can be had for the motive power should water-power not be procured. This will supply force sufficient to make two and a half tons of powder each twenty-four hours, as it will require over 300-horse power for the factory complete. In four months, if fortunate, I may be able to make two and one half tons of powder per day, and this, joined to the amount fabricated by the private mills above referred to, will give a probable supply of three and a half to four tons per twenty-four hours at that time."<sup>65</sup>

Two large groups of buildings were prepared. One group contained the refinery and store-rooms—the other comprised the mills, twelve in number. Both groups were arranged on the canal which supplied water-power to Augusta, and while the mills were driven by steam, this canal served as the means of transport for the material from point to point of its manufacture.<sup>66</sup>

It was in the autumn of 1862<sup>67</sup> that powder began to be produced in the government mills at Augusta. This plant continued in successful operation until the close of the war, and furnished powders of the best quality. Indeed, this establishment was considered among the finest and most efficient powder mills in the world at the time, if not the very best.<sup>68</sup>

#### A. The Manufacture of Powder

The output of powder by the Augusta Mills and by the arsenals of less importance was sufficient to meet the requisitions during the remainder of the war, although armies were at times short of ammunition on account of inadequate trans-

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<sup>65</sup>Rains to Gorgas, July 25, 1861, *Off. Rec.*, Ser. IV, Vol. I, 557.

<sup>66</sup>Gorgas, 73.

<sup>67</sup>Gorgas, 75.

<sup>68</sup>Mallet, 4.

portation facilities. During the year beginning September 30, 1862, and ending September 30, 1863, there were manufactured at the several arsenals 36,531,466 rounds of small-arm cartridges, and there had been issued 298,305 rounds of ammunition for field, siege, and heavy artillery. The sulphur was furnished mainly by the Niter and Mining Bureau and from abroad.<sup>69</sup>

October 13, 1864, Colonel Gorgas reported that the arsenals and machinery for the manufacture of powders were ample for a war conducted on any scale, and that the establishments were so arranged as to be "almost beyond casualty." The output of powder was governed by the supply of saltpeter and sulphur, especially the saltpeter. In regard to the latter, dependence was upon the Niter and Mining Bureau and upon importations.<sup>70</sup>

On December 31, 1864, General Gorgas reported the following mills at the disposal of the Department, together with their daily output, as being ample for all purposes:

Augusta Mills .....	per day 5,000 pounds
Selma Mills .....	per day 500 pounds
Raleigh Mills .....	per day 600 pounds
Richmond Mills (in a few weeks) .....	per day 1,500 pounds
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7,600 pounds	

In addition, there was a private mill at Charlotte, North Carolina, while the Navy Department owned an excellent mill at Columbia, South Carolina.

By running the mills day and night the products could have been nearly doubled.

The quantity of small arm ammunition in the hands of the troops in the field was about eighty to ninety rounds to the man, or more than twice as much per man as had been expended in the greatest battles of the war. At Chancellorsville about

<sup>69</sup>Gorgas to Seddon, November 15, 1863. (Report of Gorgas on ordnance production from September 30, 1862 to September 30, 1863). *Off. Rec.*, Ser. IV, Vol. II, 956-959; Gorgas, 75; Mallet, 4.

<sup>70</sup>Gorgas to Seddon, October 13, 1864. *Off. Rec.*, Ser. IV, Vol. III, 733-734.

twenty-five rounds per man were used, and at Gettysburg, about thirty rounds per man.<sup>71</sup>

On November 12, 1864, there was on hand at the several arsenals and depots, an aggregate of 5,376,034 small-arm cartridges; 50,480 rounds of siege and seacoast projectiles; and 133,962 rounds of field artillery ammunition. No apprehension was felt concerning the future supply of powder providing enough saltpeter was obtained for its manufacture.<sup>72</sup> Until Sherman's march into South Carolina in January, 1865, cut Richmond off from Augusta, the chief difficulty in obtaining an adequate supply of good powder for the army in Virginia was the miserable condition of railway transportation.

In September, 1862, the erection of a central ordnance laboratory for the production of artillery and small arms, ammunition and the innumerable minor articles of ordnance equipment was decided upon, and placed in charge of Dr. J. W. Mallet. A few weeks later work was begun. About one hundred and forty-five acres of land near Macon, Georgia, was purchased and enclosed. A branch track was run from the Macon and Western Railroad, and the erection of buildings was begun. The establishment was elaborately and systematically planned. Three main buildings, with a frontage of about twelve hundred feet, connected with one another, the middle building being about six hundred feet long. Forty detached buildings were included in the design which was prepared by Dr. Mallet with the approval of Colonel Gorgas. Brick for the works was made at another point near Macon. Orders were sent to England for a large and varied assortment of special machinery for making percussion caps, friction primers, pressed bullets and similar things, and for several large steam engines to furnish motive power. A large installment of this machinery, including the largest pair of engines, had reached Bermuda when blockade running practically came to an end near the close of the war. As for the other work, it was subjected to many delays and proceeded slowly, but the main buildings were practically completed and some of the smaller ones had been begun when the war closed.<sup>73</sup>

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<sup>71</sup>Gorgas to Seddon, December 31, 1864. *Off. Rec.*, Ser. IV, Vol. III, 986-988.

<sup>72</sup>Gorgas to Seddon, December 31, 1862. *Off. Rec.*, Ser. IV, Vol. III, 986-988.

<sup>73</sup>Mallett, 4-5.

A large central armory, which was to be equipped with a thoroughly modern plant of machinery for making small-arms, and to which was to be removed the machinery temporarily in operation at Richmond and Fayetteville, was projected, and put in charge of Lieutenant-Colonel J. H. Burton. This armory was to be located on the site of the temporary arsenal at Macon, Georgia. In 1863, the buildings were begun, but were far from completion when the war came to an end. In the meantime Colonel Burton had gone abroad to contract for the necessary machinery, chiefly with the firm of Greenwood & Botley, at Leeds, England, and when the war closed much work had been done towards filling the large contracts.<sup>74</sup>

### B. The Manufacture of Small-Arms

But before the work on the large armory was begun, 400,000 stands of infantry arms were received by the Confederate Government. The supply was made up approximately as follows:

Good rifled arms on hand at the beginning of the war, including the arms in the hands of volunteer companies.....25,000

New arms manufactured in the government and in private establishments .....40,000

Arms received from the battle-fields and put in good order (this includes the great number of arms picked up by the soldiers) .....50,000

Imported, January 1, 1862 to July 1, 1863 .....185,000

Total .....400,000<sup>75</sup>

In the great battles of the summer of 1863, particularly at Vicksburg, Port Hudson, and Gettysburg, at least 75,000 stands of arms were lost. Notwithstanding this loss the supply on hand steadily increased. During the year ending September 30, 1863, the armories at Richmond, Fayetteville, and Asheville produced an aggregate of 28,000 small arms, while about 7,000 were manufactured at private establishments. Of the whole number, about 30,000 were infantry, and about 5,000 were cavalry arms, 3,000 of the latter being sharp carbines, and the remainder were

<sup>74</sup>Mallet, 5.

<sup>75</sup>Gorgas, 86-87.



muzzle-loading of the uniform caliber of .5775, adapted for all muzzle-loading arms for infantry and cavalry.

At Macon, Columbus, and Atlanta, Georgia, revolver pistols were being made at the rate of 500 per month, and an increased production of 1,000 per month was expected in three or four months. An abundant supply of sabers was produced, although the style of workmanship could have been improved.<sup>76</sup>

On account of the depletion of the number of workmen by the conscription acts, the number of small arms manufactured during the year ending September 30, 1864, was about 20,000 instead of 50,000 to 60,000 as had been anticipated.<sup>77</sup> The return for the year ending November 30, 1864, gave for the number of arms manufactured and made up of parts derived from capture and other sources the following:

Rifles, caliber .58 .....	12,778
Carbines .....	5,354
Pistols .....	2,353

Many of these had been distributed before the end of the year. From the residue of the above and from the supply previously on hand there were available for distribution at this time the following:

Rifles of caliber .58.....	3,882
Rifles of caliber .54.....	2,759
Smooth-bore muskets .69 .....	3,564
Smooth-bore muskets .75 .....	636
All other infantry arms .....	10,504
Carbines .....	2,596

As for the future output, it was estimated that with a sufficient force of workmen, the machinery under the control of the Ordnance Bureau was capable of manufacturing 55,000 rifles and carbines per annum as follows:

<sup>76</sup>Gorgas to Seddon, November 15, 1863. *Off. Rec.*, Ser. IV, Vol. II, 955-959.

<sup>77</sup>Gorgas to Seddon, October 13, 1864. *Off. Rec.*, Ser. IV, Vol. III, 733.



	Rifles	Workmen
Richmond Armory .....	25,000	450
Fayetteville Armory .....	10,000	250
Columbia, S. S. Armory.....	4,000	125
Athens, Ga. Armory .....	10,000	250
Tallasse, Ala. Armory .....	6,000	150
	<hr/>	<hr/>
Total.....	55,000	1,225

The most serious problem which now confronted the Ordnance Department in the manufacture of small arms was that of obtaining a sufficient and capable force of men to operate the armories successfully. This difficulty was due to the reduction of employees by the conscription acts,<sup>78</sup> by detailing of men for local defense, and by desertions.<sup>79</sup> Experience had proved that men for this work must be permanently attached to the establishments, and excused from the performance of all military duties, except perhaps local guard duty. It was due also to the lack of workmen that pistols and sabres for the cavalry were not produced in larger numbers.<sup>80</sup>

### C. The Manufacture of Artillery

By September 30, 1863, there had been manufactured in the arsenals, armories and workshops of the Confederacy one hundred and thirteen pieces of artillery, of which thirty-one pieces were of the heavier class. The sea-coast guns were cast mainly at the Tredegar works at Richmond. Also, most of the various classes of field guns—Napoleons, Parrotts, howitzers, and banded cast iron guns—were made at this establishment. The purchases from abroad before the above date amounted to two hundred and thirty-nine cannon, of which forty-six were heavy guns. The artillery in the service of the armies east of the Mississippi at this time was said to equal that of the enemy, the Confederate arsenals sending to the field

<sup>78</sup>General Orders, No. 82, October 20, 1864. *Off. Rec.*, Ser. IV, Vol. III, 741.

<sup>79</sup>Mallet, 15.

<sup>80</sup>Gorgas to Seddon, December 31, 1864. *Off. Rec.*, Ser. IV, III, 986-988.

six hundred and seventy-seven pieces, since October, 1862, with an appropriate supply of carriages, ammunition, and harness.<sup>81</sup>

These facts are taken from the report of Gorgas, cited above, but there seems to be a discrepancy in that three hundred and twenty-five guns more were issued from the arsenals than were manufactured and imported. The latter number may have been made up of guns captured, or picked up on battlefields and brought to arsenals and armories, also those brought from forts.

As a result of the labors of Major J. W. Mallet, superintendent of the laboratories, the artillery service became more effective due to an improvement in the quality of ammunition manufactured.<sup>82</sup> Steel Cannon were not made, as there were no facilities for making steel, and no time to experiment.

When copper became scarce, especially after the loss of the Ducktown Mine in East Tennessee, the manufacture of bronze field pieces was suspended. As a substitute for this deficiency, the twelve-pounder Napoleon, made of iron, and with an iron jacket, was manufactured. This gun weighed 1,250 pounds, and proved very satisfactory. With a smooth-bore, it could discharge grape and canister with good effect, and at the distance at which the serious work of the artillery was done, it was more than a match for the rifled artillery. Then, too, it could be drawn by four horses.<sup>83</sup>

The lack of facilities for the manufacture of heavy guns severely handicapped the efforts of the Confederates to beat off the Federal men-of-war from the southern ports. The ten-inch were the largest guns cast in the South, and these were made at the Tredegar Works only, so that regardless of the energetic and able efforts of the Chief of Ordnance, heavy guns could not be produced rapidly enough to meet the appeals for defense of important points on the sea-coast, especially Pensacola, Yorktown, Charleston, and New Orleans.<sup>84</sup> Just be-

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<sup>81</sup>Gorgas to Seddon, November 15, 1863. *Off. Rec.*, Ser. IV, Vol. II, 956; Gorgas, 93; Brown, F. L., Dr. William Leroy Brown, 216.

<sup>82</sup>Gorgas to Seddon, November 15, 1863. *Off. Rec.*, Ser. IV, Vol. II, 956.

<sup>83</sup>Gorgas to Seddon, October 13, 1864. *Off. Rec.*, Ser. IV, Vol. III, 733; Gorgas, 93; Brown, *op. cit.*, 216-218.

<sup>84</sup>Gorgas, 93-94.

fore the close of the war, however, a twelve-inch gun was cast by the Tredegar Works. This gun was cast about a hollow core through which water was kept flowing in order to cool the castings from the inside. A marked increase of strength and greater hardness and smoothness to the finished bore resulted from this method of cooling.<sup>85</sup>

The report of the issue of guns from the Tredegar Works from July 1, 1861, to January 1, 1865, gives 341 Columbiads and siege guns, and 1,306 field pieces, made at the Tredegar Works or captured.<sup>86</sup> During the latter part of the war the Selina Armory cast many heavy guns for both the army and navy.<sup>87</sup>

### 3. Obtaining Raw Materials for Arms and Ammunition.

Difficult as was the securing of machinery with which to manufacture munitions of war, this work was further greatly hampered by the scarcity of raw materials, and the difficulty of obtaining those which were available.

Throughout the war the short-comings in the production of lead, iron, copper, zinc, and niter were keenly felt, but this was especially the case during the first year when there was no effective organization for securing these and other ordnance materials. The organization of an efficient Niter and Mining Bureau in April, 1862, greatly improved conditions; but until this was done the department had great difficulty in obtaining the scantiest supplies.

The Virginia lead mines at Wytheville which yielded 100,000 to 150,000 pounds per month, met in part the consumption of lead. Through the laborious exertions of agents employed for the purpose, lead was collected in considerable quantities throughout the country.<sup>88</sup> The following from the report of Colonel Gorgas of August 12, 1861 will illustrate the activities along this line during the early months of the war:

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<sup>85</sup>Gorgas, 94.

<sup>86</sup>Gorgas, 81.

<sup>87</sup>Mallet, 6; Gorgas, 82-83.

<sup>88</sup>Gorgas, 73-74.

"An order has been given to a party to deliver 500 tons of lead at Columbia, Tex. ,at 7 cents per pound, and to another to deliver a like amount in San Antonio, at 6 cents. What abilities these parties have to execute these orders remains to be seen. Besides the Wytheville mine, in this State (Virginia) the Confederate Government has directed the working of a mine in North Carolina. In refeernce to this Governor Warren Winslow writes, August 8: 'I have written to Pasco, an experienced miner, to come down and get ready to open the Silver Hill Mine, in Davidson County. It will not require much means. The furnace will cast only 500, I think, and labor is now so cheap that a small addition will be all that is required.' These two mines will, it is believed, supply all our wants. The following letter is from Prof. E. Emmons, State Geologist of North Carolina, under date of July 24: 'I made, some time since, a thorough examination of the lead mine in Caldwell County, fourteen miles north of Morgantown. It will not, therefore, be necessary for me to visit and examine the mine at present. For the information of the Departments I have addressed a letter to Calvin J. Cowles, of Wilkesborough, who owns, or did own, a lease on the property, to open and make the mine at once, if possible. Lead can be taken out at once, or from the present shaft and tunnel, and I have given him assurance that I will put him or a company in a way for easy reduction of the ore, and also repeated to them the assurance conveyed in your instructions to me, that a liberal price would be paid for any amount of lead that was produced.'<sup>89</sup>

Other sources of supply of lead were the supplies brought from abroad through the blockade, from the careful gleaning of battle-fields, from the collection throughout the country of window weights, lead pipes, cistern linings, and even clock-weights. Small lead smelting works were set up at Petersburg, Virginia, under the direction of Dr. Piggott, formerly of Baltimore.<sup>90</sup>

The following estimate made by Colonel Gorgas is of interest concerning the amount of lead used during the war in making of cartridges, and concerning the source of the raw materials:

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<sup>89</sup>Gorgas to Confederate Congress C. S. A., August 12, 1861, *Off. Rec.*, Ser. IV, Vol. I, 555-556.

<sup>90</sup>Gorgas, 73-74; Mallet, 10; Pollard, *Life of Jefferson Davis*, 225; *Charleston Courier*, March 27, 1862.

	Pounds
From Trans-Mississippi mines (early in the war) .....	400,000
From the Virginia mines (about 60,000 pounds per month) .....	2,160,000
On hand at arsenals .....	140,000
Imported .....	2,000,000
Picked up through the country on battle-fields.....	5,300,000
Total.....	10,000,000

The collection of lead in Charleston alone amounted to 200,000 pounds, made up of window-weights, and other forms of loose lead; while the lead water-pipes in Mobile yielded an equal supply.<sup>91</sup>

Despite the energetic work of the Department, and the patriotic sacrifices of the people, the scarcity of lead was bitterly felt as the following extract of a letter of Colonel Gorgas of July 18, 1863, to H. Oladowski, Ordnance Officer of the Army of Tennessee, will indicate:

"The circular of June 22, limiting the issue of ammunition to 3 (?) rounds per man per month, is rendered absolutely necessary by the scarcity of lead, and if we cannot keep up the supply to 140 rounds per man, I hope you will understand that it is from causes beyond my control."<sup>92</sup>

Iron was much needed for cannon and projectiles, and in order to stimulate its production in Virginia, North Carolina, Tennessee, Georgia, and Alabama, contracts were made with ironmasters in these states on liberal terms, and advances in money made to them to be refunded in products. These contracts were difficult to arrange as the contractor demanded so much—such demands as details from the army and the privilege of transporting provisions and other supplies over the railroads. The constant depreciation of the currency also hampered this work. However, with the able assistance of Mr. Benjamin, who succeeded Mr. Walker as Secretary of War, Colonel Gorgas was quite successful in making contracts.<sup>93</sup>

<sup>91</sup>Gorgas, 92.

<sup>92</sup>Off. Rec., Ser. I, Vol. XXIII, Part II, 927.

<sup>93</sup>Gorgas, 75.

Copper, so necessary for the manufacture of percussion caps and bronze Napoleon guns, was obtained early in the war from the mines of Tennessee, but the occupation of these mines by the Federal forces checked these sources of supply and great anxiety was felt concerning the future store of copper. To meet the emergency, the manufacture of bronze Napoleons was discontinued, and all available copper was carefully husbanded for the manufacture of caps. It soon became apparent that this supply would soon be exhausted. Furthermore, the prospects of supply from abroad could not be relied upon. In this dilemma the authorities cast about for a solution of the difficulty, and it was determined to render available, if possible, some of the copper, turpentine, and apple brandy stills which existed in large numbers in North Carolina. With the approval of the Chief of Ordnance, an officer was secretly dispatched with the necessary authority to purchase or impress all copper stills found available, and ship them, cut into strips, to the Richmond arsenal. An amount sufficient for the manufacture of percussion caps to supply the armies during the last year of the war was thus obtained.<sup>94</sup>

Scrap-iron, old brass, saucepans, plantation bells, church bells, and anything made of metal were eagerly sought for use as ordnance material. The people readily responded to calls for this material—some going so far, it has been said, as to remove the tin roofs from their homes. In the spring of 1862, the planters of Tennessee readily responded to the call of General Beauregard, and gave their bells to be used for the manufacture of field artillery.<sup>95</sup>

Whenever it was possible the battlefields were carefully leaned for cannon, arms, lead, in fact anything which could be used in the manufacture of ordnance. An extract of a letter by Lieutenant-Colonel Briscoe G. Baldwin to Colonel Gorgas throws some light on the conduct of this branch of service; Concerning such work on the field of Chancellorsville, Colonel Baldwin said:

“The field is so extensive—ranging from Fredericksburg, a distance of 10 miles, through dense woods and deep ravines—

<sup>94</sup>Brown, *op. cit.*, 218-219; see Gorgas, 69; Mallet, 10-11.

<sup>95</sup>Beauregard to Gorgas, March 25, 1862. *Off. Rec.*, Ser. I, Vol. X, Part II, 362. See Pollard, 225; Charleston Courier, March 27, 1862; Charleston Courier, April 3, 1862.

that it has been very difficult to collect the arms and almost impossible to estimate their number. I should say that there may be about 20,000, of which 12,000 may be set down as trophies. They have been collected and placed in prominent places on the roadside, and are being transported to the railroad depot as speedily as our limited transportation and broken-down condition of the animals will admit. I will have the field thoroughly gleaned. The ordnance officers have generally discharged their duties faithfully.<sup>96</sup>

#### 4. The Work of the Superintendent of Laboratories.

In the efforts to obtain arms of some kind, both at home and abroad, in the early part of the war a varied assortment was accumulated. It is said that there were at one time twenty different patterns of infantry weapons in the hands of the troops. Among these were the Springfield and Enfield muskets, Mississippi and Maynard rifles, and arms of English, German, Austrian and Belgian manufacture, of many different calibers. Also there were Hall's and Sharp's carbines, and many styles of sea-coast and field guns. Since the quality of ammunition made at the different arsenals varied, there was necessarily serious trouble both at the arsenals and in the field in providing the proper ammunition for a particular arm. In order to remedy this difficulty, Colonel Gorgas saw that it was necessary to appoint a general superintendent of all the laboratories, with authority to supervise and inspect the operation and output of the establishments. In the summer of 1862, he selected for this important position Lieutenant-Colonel J. W. Mallet,<sup>97</sup> who

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<sup>96</sup>Baldwin to Gorgas, May 7, 1863. *Off. Rec.*, Ser. I, Vol. XXV, Part II, 795.

<sup>97</sup>John William Mallet was born in Dublin, Ireland, in 1832. He was educated at Trinity College and at Gottingen, and in 1853 he came to the United States to become chemist of the Geological Survey of Alabama. He was Professor of Chemistry in the University of Alabama (1855-1860), and held the same position in the State Medical College until the Civil War. Early in the war he was aide-de-camp on the staff of General Rodes, and in the summer of 1862 he was induced by Colonel Gorgas, Chief of Ordnance, to accept the position as superintendent of laboratories. After the war he was Professor of Chemistry at the University of Louisiana until 1868, when he went to the University of Virginia. During the scholastic year 1883-84, Dr. Mallet held the Chair of Chemistry and taught Physics in the University of Texas. He was at the same time Chairman of the Faculty, the institution being then governed by the Faculty as a whole without the headship of a president. In 1864. he



was at the time serving as aide-de-camp on the staff of General Rodes.

After his transfer to the ordnance corps, Mallet was given a commission as Captain of Artillery, and ordered at once to endeavor to bring order out of the confusion above mentioned. In compliance with this order the months of August and September were spent in visiting the principal ordnance establishments, and in conferring with the chief field ordnance officers. A report was then drawn up, with recommendations for rules to be observed. After being approved by Colonel Gorgas, the report and recommendations were ordered to be printed and distributed. In the meantime orders were sent to Europe for a number of accurately tested street guages.

Under orders from Colonel Gorgas, Mallet prepared the plans and preliminary drawings for the central ordnance laboratory, the construction of which has been described. The purpose of the central laboratory was to aid in harmonizing and improving the work of supplying ordnance.

In pursuance of his instructions, the superintendent of laboratories was to make Macon, Georgia, his headquarters, to supervise the construction of the central laboratory and to visit at frequent intervals the important arsenals, the headquarters of the principal armies in the field, and chief fortified seaports, in order that the work should be harmonized and improved, and to keep the Chief of Ordnance informed of the relations of the different parts of the work. The original orders required that visits be made monthly to each point. However, this could not literally be accomplished as particular points often required additional attention. For example, Mallet was several times ordered

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returned to the University of Virginia where he became Emeritus Professor of Chemistry in 1908. Dr. Mallet died on November 7, 1912, after a brief illness. His death was sincerely mourned by his many pupils, friends and comrades, while the world of literature and science has been deeply bereaved through the loss of this distinguished son.

In 1882 Dr. Mallet served as President of the American Chemical Society. In 1858, he and his father, Robert Mallet, prepared for the British Association a Catalogue of Earthquakes; in 1862, he published a book entitled "Cotton;" in 1868, "Chemistry Applied to the Arts;" in 1809 (rev. ed. 1901) "Syllabus of a course of lectures on General Chemistry." Also he has contributed to several chemical journals.

New International Encyclopedia; The Alcalde, 1, 14-17, 21, 24.



to go to Charleston during the seige in 1863 to investigate complaints as to the burning of time fuses and injury from dampness to ammunition in the bomb-proof magazines of Fort Sumter and on Morris and Sullivan Islands.

In discharging his duties, Captain Mallet frequently witnessed battles, as for instance, the attack on Charleston, 1863; the skirmishing in front of Rocky Face Ridge of General Johnston's army in May, 1864, at the opening of the campaign from Dalton to Atlanta; Petersburg, July, 1864; and at Winchester, in September, 1864, where General Rodes was killed.<sup>98</sup>

#### **5. The Manufacture of Infantry, Artillery, and Cavalry Equipments.**

The first Confederate armies went into the field with no accoutrements or equipments. Haversacks, made by the women from cotton cloth, supplanted knapsacks. Leather was needed for cartridge boxes, shoes, artillery harness, bridles and saddles, and on account of the inadequate supply for all these a scale of preference was established as follows: shoes, cartridge boxes, artillery harness, saddles, bridles. To economize the leather, the waist and cartridge-box hilts were made of prepared cotton cloth, stitched in three or four thicknesses. Bridle reins were also made of this material, and cartridge boxes, with the exception of the flaps, were covered with it. Many saddle skirts, too, were made of heavy cotton cloth strongly stitched.<sup>99</sup>

In order to get leather, each department bargained for its own hides, made contracts with the tanner, procured hands for him by exemptions from the army, got transportation over the railroads for the hides and for supplies, and assisted the tanners to procure food for his hands and other supplies for his tannery. A fishery was established on the Cape Fear River to get oil for mechanical purposes, and at the same time food for the

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<sup>98</sup>Mallet, 8-9; Gorgas, 87-88.

<sup>99</sup>Gorgas, 77-78; Davis, I, 478.

An attempt was made to economize leather in the manufacture of shoes by accepting a patent offered by a Southern admirer from Washington. Under this patent no leather was used except for making the soles. These shoes were not, however, satisfactory, as the soldiers eagerly exchanged them with the first prostrate enemy who no longer had use for his foot-wear. Gorgas, 78.

workmen. Thus, necessity compelled the Ordnance Bureau to perform varied functions. It was only by thorough organization that the many duties could be performed.<sup>100</sup>

In cavalry equipments, a good saddle was of first importance. In this, the back of the horse, and not the rider's seat, was the point to be achieved, as the rider soon accommodated himself to the seat provided for him, but the animal's back always suffered from a bad saddle. Various patterns were tried with reasonable success. The Jenifer's tree, for example, did well while the horses were in good condition, and was praised by the great cavalry leader, General J. E. B. Stuart, but this saddle proved unsatisfactory when the horses became lean as it came down on the horse's backbone and withers as soon as the cushion of fat and muscle dwindled. The McClellan tree was more comfortable for the horse, but not as durable as the Jenifer's tree.<sup>101</sup>

It was very difficult to provide horseshoes for the cavalry and artillery service. Skilled labor and iron were both insufficient, while the manufacturing was necessarily in such blacksmith shops as were accessible to the army or army headquarters. The already overtaxed condition of the railroads caused any plan of a central establishment for this work to be discarded.<sup>102</sup>

## 6. Increase of Ordnance Establishments.

In addition to the establishments previously mentioned, others were added from time to time, as New Orleans, Columbia, South Carolina; Atlanta and Columbus, Georgia; Selma, Alabama; and Jackson, Mississippi.<sup>103</sup> At Austin, Texas, an arsenal was established which turned out several brass cannon and performed other services. A cap and cartridge factory was established in the same city, the Supreme Court building being used for this purpose.<sup>104</sup> On the other hand, invasion by the forces of the enemy caused the abandonment of the Nashville Arsenal, the New Orleans Depot, and the establishment of smaller importance.<sup>105</sup>

<sup>100</sup>Gorgas, 78; Davis, I, 478-479.

<sup>101</sup>Gorgas, 78-79; Davis, I, 479. See Lee to Gorgas, June 18, 1863, *Off. Rec.*, Ser. I, Vol. XXXII, Part III, 872.

<sup>102</sup>Gorgas, 79; Davis, I, 479.

<sup>103</sup>Mallet, 6.

<sup>104</sup>Lubbock, F. R., *Memoirs*, 368-369.

<sup>105</sup>Mallet, 6.

It is deemed fitting at this point to note the kind of ordnance produced at the different establishments. Heavy artillery was at first turned out only at Richmond (Tredegar Works), later it was produced at Selma; field artillery was made and repaired chiefly at Richmond and Augusta; small arms at Richmond and Fayetteville; caps and friction primers at Richmond and Atlanta; accountrements quite largely at Macon; bullets (cast) and small arms cartridges were prepared almost everywhere. The products of the different arsenals and work shops naturally went to supply the armies and forts which were nearest, although demands from a distance often had to be met. Thus the Army of Northern Virginia and the forces at Wilmington were supplied mainly from Richmond; the army of Tennessee as well as Charleston and from Atlanta and Augusta chiefly; while all the armies and fortified sea ports looked to Augusta for powder. In addition to the establishments named, large supplies of saddlery, harness, and accoutrements, were obtained by contract with private persons widely scattered over the country.<sup>106</sup>

Other establishments which aided the ordnance service were the Crenshaw Woolen Mills at Richmond, several cotton mills, which turned out coarse cloth, two of the largest of these mills being located at Augusta and Macon; small iron furnaces and forges were scattered over Virginia, North Carolina, Tennessee, Georgia, and Alabama.<sup>107</sup>

## 7. Miscellaneous Duties of the Ordnance Department.

An important phase of work which devolved upon the ordnance officers was that of organizing and drilling forces for local defense. These forces were made up of white workmen and other employees at several of the arsenals.<sup>108</sup> As early as June 3, 1861, operatives of the Tredegar Works were organized in an effective force of three hundred men to be used for defensive purposes.<sup>109</sup> This arrangement was continued with good results throughout the war.

When McClellan was advancing upon Richmond Lee conceived the idea of constructing an iron-plated battery, which

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<sup>106</sup>Mallet, 6; Off. Rec., Ser. IV, Vol. I, 762-763.

<sup>107</sup>Mallet, 7.

<sup>108</sup>Mallet, 17.

<sup>109</sup>Off. Rec., Ser. IV, Vol. II, 240-241.

would be placed on trucks and upon which would be mounted a heavy gun. The entire machine was to be covered with iron, and was to move along the York River Railroad. However, no information has been obtained as to whether or not such a machine was constructed and operated.<sup>110</sup>

Among other miscellaneous duties of the ordnance department were the dispensing of ordnance to the armies, the transfer of ordnance at various times, the removal of stores and machinery, when possible, upon the invasion of the enemy, and even the furnishing of blasting powder for the mining of coal.<sup>111</sup>

At the Augusta Mills measures for defense had been taken by Major Rains early in the year 1862 when, acting under the instructions and authority of General Lee, he placed obstructions in the Savannah River in order to prevent attack by water. Any force he might raise from the employees would not, however, be of sufficient strength to repel invaders by land. Threats of invasion by the enemy in the spring of 1862 caused him to suggest the stationing of a permanent force at or near Augusta for the purpose of protecting the government establishments there. This suggestion was approved by Colonel Gorgas, but was seemingly ignored by the War Department.<sup>112</sup> The only available defenses for the mills and city were such forces as could be mustered from the employees and from citizens of the city and vicinity who were not already enrolled in the armies. The threatened attacks passed by for the time, but in July, 1863, large forces of the enemy were on the coast, and the mills at Augusta were in real danger of cavalry raids. Writing to Secretary Seddon on July 23, 1863, Major Rains pointed out the futility of defending the place by organizing local companies. He also emphasized the importance of the establishments, and requested that an adequate force be provided for their defense.<sup>113</sup> In reply, Mr. Seddon stated that those liable to conscription could not be enrolled in corps for local defense without violating the provisions of the act which required such men to fill old organiza-

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<sup>110</sup>Lee to Gorgas, June 5, 1862. *Off. Rec.*, Vol. XI, Part III, 574.

<sup>111</sup>*Off. Rec.*, Ser. I, Vol. VI, 646; *Off. Rec.*, Ser. I, Vol. XI, Part III, 504; *Off. Rec.*, Ser. I, Vol. XIX, Part II, 611; Mallet, 12-16.

<sup>112</sup>*Off. Rec.*, Ser. I, Vol. XIV, 531, 533, 562.

<sup>113</sup>Rains to Seddon, July 23, 1863. *Off. Rec.*, Ser. IV, Vol. II, 660-661.

tions.<sup>114</sup> All others could, under the instructions of the War Department, enroll for local defense, and could restrict their service to the defense of Augusta and vicinity. This arrangement led to considerable embarrassment as Governor Brown of Georgia had methods of his own which did not always conform to those of the central government. The Secretary of War was disposed to do what was most expedient. He was not unmindful of the patriotic spirit which Governor Brown had always manifested in raising troops for the armies. The whole matter of the organization of local troops in Georgia was intrusted by the President to General Howell Cobb. A treatment of this work does not belong in this narrative, but it may be noted that the forces provided for the defense of the Augusta establishments were sufficient to keep them out of the hands of the Federals until the end of the war.<sup>115</sup>

On account of Confederate reverses at Vicksburg and vicinity in 1863, alarm was felt for the safety of Atlanta and the valuable foundries and arsenals there. In order to be able to meet the threatened attacks, several attempts were made to organize the citizens into a corps for defense. But since there was no leader to command these forces, the efforts toward organization failed. It was the "general desire" of the citizens that Major M. H. Wright, ordnance officer in charge of the Atlanta Arsenal, be placed in control of the defenses and troops at Atlanta. Colonel St. John, Colonel Gorgas, and Colonel J. F. Gilmer, Chief of the Engineer Bureau, recommended to the Secretary of War that authority be given to Major Wright to meet this request, and that he be given power to organize companies into battalions for local defense and that the rank of lieutenant-colonel be temporarily conferred upon him. Secretary Seddon promptly granted this request.<sup>116</sup> Colonel Wright continued in charge of the Atlanta Arsenal and of the forces of defense until August 4, 1864, when he was placed in command of the arsenal, armory, and laboratories at Macon, Georgia.<sup>117</sup>

The Macon establishments were defended by a small battalion of two companies, under the command of Major Mallet,

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<sup>114</sup>Seddon to Rains, July 30, 1863. *Off. Rec.*, Ser. IV, Vol. II, 684.

<sup>115</sup>*Off. Rec.*, Ser. IV, Vol. II, 705, 764, 801-802.

<sup>116</sup>Hall to Gilmer, July 9, 1863. *Off. Rec.*, Ser. I, Vol. XXIII, Part II, 910; Gilmer and Gorgas to Cooper, July 14, 1863, *ibid.* 909-910.

<sup>117</sup>General Orders, No. 1, *Off. Rec.*, Ser. I, Vol. XXXVIII, Part V, 946.

and a section of artillery, commanded by Major Taliaferro. In July, 1864, these forces, aided by a portion of a Tennessee battalion and by a small body of Georgia troops, succeeded in driving off General Stoneman's cavalry which had been sent by General Sherman to destroy the Macon works and release the Federal prisoners at Andersonville. A day or two later General Stoneman with about seven hundred mounted men surrendered to General Iverson. Again, late in November, when Sherman was well on his way to Savannah, the extreme right of the army, with Kilpatrick's cavalry, made a feint upon Macon, and had a skirmish with a small body of local troops. The ordnance troops were called out, but the enemy had disappeared when they arrived. At the very close of the war a cavalry force of five or six thousand men under General Watson was moving toward Macon from the west. With only a small force, but with plenty of ammunition, it was determined to make as great a show of force as possible by keeping up a heavy fire all along the line as soon as the enemy should appear. On the afternoon of April 20, the defending forces were posted on the line of earthworks which had been prepared several months before. While waiting for the arrival of Wilson's forces which were expected at any hour, a joint telegram was received from Johnston and Sherman. This telegram announced that negotiations were being made for the close of hostilities, and ordered an immediate armistice between Wilson's command and the opposing Confederate forces.<sup>118</sup>

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<sup>118</sup>Mallet, 17-18; Evans, C. A., *Confederate Military History*, VI, 341-342.

## CHAPTER IV

### THE WORK OF THE BRANCHES OF THE ORDNANCE DEPARTMENT

#### 1. The Bureau of Foreign Supplies.

On account of the small number and poor quality of arms such as were available in the South when the Confederacy was organized and because of the inadequate facilities and lack of materials for the manufacture of arms and ammunition the authorities early considered the obtaining of such supplies from the North and from Europe. Nothing definite toward the securing of war materials from abroad was done, however, until early in April, when it became evident to every one that the country was rapidly drifting into war. Then it was that President Davis selected as purchasing agent in Europe Captain Caleb Huse, a graduate of West Point and at that time a professor in the University of Alabama.<sup>119</sup>

On April 15, Captain Huse received definite instructions from the War Department. He was directed to proceed to Europe without unnecessary delay, as agent of the Government of the Confederate States, "for the purchase of ordnance, arms, equipments, and military stores for its use."<sup>120</sup> He was to receive detailed instructions from the Chief of the Bureau of Ordnance concerning the nature and extent of purchases to be made, and their shipment with a view to a speedy delivery. Also, he was to execute instructions which might be given him by the heads of other departments of the Government.<sup>121</sup>

On May 18, 1861, Major Edward C. Anderson was given instructions similar to those given Captain Huse, and was ordered to depart at once for Europe and cooperate with Captain Huse. In case Huse could not be located, Anderson was to proceed alone in carrying out the duties with which he was charged.<sup>122</sup>

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<sup>119</sup>Huse, Caleb, *Supplies for the Confederate Army*, 9-11; Gorgas, 70; Mallet, 2; Bullock, J. D., *Secret Service of the Confederate States in Europe*, I, 53.

<sup>120</sup>Cooper to Huse, April 15, 1861, *Off. Rec.*, Ser. IV, Vol. I, 220.

<sup>121</sup>Cooper to Huse, April 15, 1861. *Off. Rec.*, Ser. IV, Vol. I, 220.

<sup>122</sup>Walker to Anderson, May 18, 1861. *Off. Rec.*, Ser. IV, Vol. I, 332-333.



Complying with the instructions from the War Department, Captain Huse left Montgomery early in April, 1861, and proceeded to New York and Canada, then to Portland, Maine, from which port he embarked on April 27 for Liverpool. When he arrived in Liverpool on May 10, Captain Huse at once put himself in communication with the house of Fraser, Trenholm & Co., on whom he had letters of credit. The members of this firm were disposed to do anything in their power to assist Captain Huse in carrying out successfully the object of his mission. But on presenting his letters it was found that he had only \$10,000 with which to purchase arms, etc., and that the letter of the Secretary of the Treasury to the above firm, informing them that drafts by Huse on the Confederate States Treasury would be honored to the amount of \$200,000, was considered by this firm as of no value in a commercial transaction.

Captain Huse went to London immediately where he soon learned that there were no small arms on the market in either England or Belgium of the kind and quality required by the War Department. The agents from the Northern States had secured the arms available. A contract was made, however, with the London Armory Company, for the purchase of 10,000 Enfield rifles at £3 16s. 6d. each, a price somewhat above that named in the instructions given by Major Gorgas, and 2,000 more than the number he was authorized to purchase. Only \$50,000 in cash, and \$50,000 more in bills of exchange were available for the above purchase amounting to about \$195,000. Mr. Prioleau, of the firm of Fraser, Trenholm & Co., very generously assumed the responsibility of the contract, trusting to be reimbursed by the Confederate Government.<sup>123</sup>

The action of Captain Huse in going beyond his instructions met with the hearty approval of Colonel Gorgas and the higher officials. In fact, so confident were they of Captain Huse's ability and good judgment in purchasing foreign supplies that they retained him in this capacity throughout the war, allowing him to make purchases exceeding fifty times his initial allowance of \$10,000.<sup>124</sup>

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<sup>123</sup>Huse to Gorgas, May 21, 1861. *Off. Rec.*, Ser. I, Vol. I, 334-346; Huse, *Supplies for C. S. Army*, 11-24.

<sup>124</sup>Gorgas, 70.



In addition to contracting for small arms, Captain Huse looked after a possible supply of artillery, but on account of not having the money with which to purchase, and with no means for shipment, he could do nothing in this line at the time. He also inspected the Armstrong gun, and made drawings of the same, suggesting that the gun could be made at home.<sup>125</sup>

After the Battle of Manassas the war assumed a more serious and gigantic aspect. The Government of the United States at once began elaborate preparations. To meet successfully the preparations on the part of the North, the Confederate Government determined to make equal preparations at whatever cost in order to prosecute the war to a successful end. To attain this object, the War Department greatly enlarged the powers of Huse and Anderson, and authorized them to depart, at their own discretion, from the terms of the original instructions. They were to purchase at the earliest possible moment all the arms suitable for the Confederate armies at any place or at any price; and if a sufficient quantity of arms could not be purchased at once, they were authorized to enter into contracts at their own discretion, and not to stop for expense or risk in securing the largest quantity of arms of the best quality, and at the earliest possible time, sufficient to arm, if necessary, not less than five hundred regiments. They were further instructed to make purchase of cannon, musket, and rifle powder in large quantities and of the best quality obtainable, and to prepare it for immediate shipment.<sup>126</sup>

On August 11, 1861, a joint report<sup>127</sup> was made by Captain Huse and Major Anderson who were now cooperating. Concerning the purchase of arms and ammunition the substance of the report was that in England prior to this time the United States Government had controlled the market, but at the date of making the report the Confederate agents were on par with their northern rivals, and would, if supplied with the means, soon have an advantage over them.

In compliance with their instructions, the Confederate agents directed their attention to other countries of Europe

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<sup>125</sup>Huse to Gorgas, May 21, 1861. *Off. Rec.*, Ser. IV, Vol. I, 343-346.

<sup>126</sup>Walker to Huse and Anderson, July 22, 1861. *Off. Rec.*, Ser. IV, Vol. I, 493-494.

<sup>127</sup>*Off. Rec.*, Ser. IV, Vol. I, 538-542.

where there appeared any probability of obtaining war supplies. In regard to Belgium, it was learned that her establishments already had more than they could do for several months, and that her arms were of a poor quality. Acting on the advice of Colonel Preston, late United States minister to Spain, it was deemed a waste of time to go to Spain for weapons. The visit to France was futile as to direct results as no arms were available, and the efforts to obtain drawings of the French field artillery were not successful. The agents might have done more had it not been for an unexpected call for their return to England. A telegram from Messrs. Fraser, Trenholm & Co. informed them that money from the Confederate Government had arrived, and that they were wanted in London. It was thought advisable for Huse to remain and make further inquiries. Through the assistance of Judge Rost, Commissioner of the Confederate States in France, permission was obtained to visit Vincennes Arsenal and the fortifications about Paris. Captain Huse was able to visit the arsenal at Vincennes only, as he was called to London by a dispatch from Major Anderson.

In London the agents were informed that there would be opportunity to ship material to the Confederacy within a few days, so they determined to use to the best advantage a portion of the money just received. The invoices of this shipment have been lost; but from the report mentioned above the cargo included, in addition to muskets and munitoins, various sets of equipments, complete and incomplete; large quantities of leather for harness; buckles, thread, awls, knives, etc. to be used in manufacturing; a small number of bits for bridles; ten double sets of artillery harness; twelve pieces of light twelve-pounder rifled field artillery, of the Blakely manufacture; a considerable quantity of solid shot and segmented shells; and cartridge paper sufficient for the manufacture of 200,000 cartridges. One saddle of the latest pattern adapted for the British cavalry was shipped with the leather, while one complete British infantry soldier's kit, with the price of each article marked, was shipped with the knapsacks. The contractors were prepared to furnish any quantity at these prices. As the vessel would not take gun-

powder, fifty barrels of cannon, and twenty barrels of rifle powder were reserved for the next opportunity for shipping.<sup>128</sup>

In the purchase of arms, old worn-out muskets so eagerly bought by the northern agents, were not considered, but the purchases were confined to the Enfield rifle. The contracts for these rifles and other supplies were being rapidly filled, and it was expected that in a few weeks a sufficient amount of supplies would have accumulated to warrant a shipment greater than the one just made. On account of the difficulty of obtaining vessels for such shipment, the agents considered uniting with Captain J. D. Bulloch, who was then in England, for the purchase of a fast steamer and send her over under his command. Such a steamer, at a reasonable price was then available.<sup>129</sup>

On July 1, 1861, Mr. Charles Green, a merchant of Savannah, Georgia, was appointed and directed by Secretary Walker to proceed to London and cooperate with Major Anderson and Captain Huse, speedy shipments were urged, and special directions in the nature of instructions were not given as the War Department had confidence in the discretion of its agents, and left them to exercise their judgment in matters pertaining to their mission. In due time Mr. Green joined his colleagues in London.<sup>130</sup>

The second shipment of arms was carried in the ship *Fingal*. This vessel was purchased in England by Captain Bulloch, and

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<sup>128</sup>The ship which carried the above cargo, and the first from Europe to carry munition to the Confederate States proved to be the *Bermuda*. She landed at Savannah about September 1, 1861. It has not been possible to obtain a record of the shipment. Bulloch, I, 100. See *Off. Rec.*, Ser. IV, Vol. I, 614.

<sup>129</sup>Anderson and Huse to Walker, August 1, 1861. *Off. Rec.*, Ser. IV, Vol. I, 541-542. See F. H. Morse to W. H. Seward, July 19, 1861, *Off. Rec.*, Ser. III, Vol. I, 445-446.

<sup>130</sup>Walker to Green, July 1, 1861, *Off. Rec.*, Ser. II, Vol. III, 687; Anderson and Huse to Kalker, August 11, 1861, *Off. Rec.*, Ser. IV, Vol. I, 541.

While on his return from England to the Confederate States Mr. Green was arrested and taken to Fort Warren, Boston. Although he had been in business in Savannah, Mr. Green was still a British subject, and as such he reported his capture to the British government. Apparently nothing was done in his behalf. Green to Lord Lyon, etc., November 11, 1861, *Off. Rec.*, Ser. II, Vol. II, 1033-1034.

was the property of both the War and Navy Departments. Her cargo consisted of the following:

For the War Department—10,000 Enfield rifles; 1,000,000 ball cartridges; 2,000,000 percussion caps. 3,000 cavalry sabres, with suitable accoutrements; a large quantity of material for clothing; and a large supply of medical stores.

On account of the Navy Department—1,000 short rifles, with cutlass bayonets, and 1,000 rounds of ammunition per rifle; 500 revolvers with suitable ammunition; two 4½-inch muzzle-loading rifled guns, with traversing carriages, all necessary gear, and 200 made-up cartridges, shot and shell, per gun; two breach-loading 2½-inch steel-rifled guns for boats or field service, with 200 rounds of ammunition per gun; 400 barrels of coarse cannon-powder, and a large quantity of made-up clothing for seamen.

3,000 Enfield rifles were shipped for the State of Georgia, while 1,000 of the same kind were for Louisiana.

After weathering a severe storm, the *Fingal* eluded the Federal blockading ships, and entered Savannah harbor on November 12, 1861.<sup>181</sup>

As ordnance of various kinds was constantly coming into the South from the autumn of 1861 until the spring of 1865, it is not possible here to consider the numerous shipments. The following concerning a shipment awaiting some means of transportation is but one of the many examples of the energy of Major Huse as purchasing agent early in the war:

“It is miserable to look at the immense pile of packages in the warehouse at St. Andrews Wharf, and not be able to send anything—only read the following: twenty-five thousand rifles; two thousand barrels of powder; five hundred thousand caps; ten thousand friction tubes; five hundred thousand cartridges; thirteen thousand accoutrements; thirteen thousand knapsacks; thirteen thousand gun-slings; forty-four thousand three hundred and twenty-eight pairs of socks; sixteen thousand four hundred

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<sup>181</sup>Bulloch, I, 107-128.

and eighty-four blankets; two hundred and twenty-six saddles; saddler's tools; artillery harness, leather, etc."<sup>132</sup>

By March 1, 1862, Huse contracted with the Austrian Government for one hundred thousand rifles of the latest Austrian pattern, sixty pieces of rifled field artillery with caissons, field-forges, and battery wagons. These supplies were taken to Hamburg where they were prepared for shipment in March, 1862.<sup>133</sup>

On account of the difficulty of obtaining vessels for importation of ordnance, and on account of the high charges exacted for the use of such vessels, and in order to facilitate the exportation of cotton as a means of procuring money for the purchase of supplies, the Ordnance Department soon found it advisable to own and run its own steamers.<sup>134</sup> The plan was to export cotton, and import munitions of war and other supplies. Experience had proved that sailing vessels were not suitable for this service on account of the lack of speed. Accordingly the Bureau of Foreign Supplies under the direction of the chief of ordnance took steps to purchase and run steamers. From experience, too, the officials learned that a continuous voyage from Europe to the Confederate ports rendered the vessels more susceptible to capture than a voyage to the West Indies where the cargo was unloaded, thence to be carried to the southern ports in other ships. In order that the work of the Bureau might be most effective, an arrangement was made by which supplies were brought from Europe to Bermuda, Nassau, and Havana. These supplies were then loaded on Confederate steamers which would slip through the Federal fleet and land in the Southern ports, chiefly Wilmington and Charleston. Many shipments, however, were taken to Matamoras, Mexico and then smuggled across the Rio Grande to Texas. In return for the supplies cotton was shipped to the depots in the West India Islands, and then carried to Europe.

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<sup>132</sup>Huse to Anderson, December 30, 1861, in Davis I, 482-483. Colonel Anderson returned to the South on the *Fingal*. It was thought that his presence in Europe was no longer necessary as Major Huse had the work so well in hand. Bulloch, *op. cit.*, I, III.

<sup>133</sup>Huse, *Supplies for the Confederate States*, 26-27; Huse to Gorgas, March 15, 1865, *Off. Rec.*, Ser. IV, Vol. I, 1003-1005.

<sup>134</sup>Gorgas, Ordnance Department, 79-81; Gorgas to Seddon, Dec. 5, 1862. *Off. Rec.*, Ser. IV, Vol. II, 227-228.

The vessels which were most successful in bringing supplies from the West Indies to the Confederate ports were swift, long, low, and narrow. Generally they were painted a color which conformed as nearly as possible to the color of the ocean waters. To further avoid attracting attention, anthracite coal was used when available. Steamers thus equipped were able to slip in and out of the Confederate ports, especially Wilmington, almost at will. So infrequent were captures made by the Federal ships that inferior steamers, even those capable of carrying only a few bales of cotton, entered the service of blockade running.

Among the most successful vessels which were used in running the blockade was the *Robert E. Lee*, a vessel purchased at a cost of \$30,000, and capable of carrying six hundred and fifty bales of cotton. Under command of Captain Wilkinson, of the navy, she ran between Bermuda and Wilmington, and made from fifteen to eighteen trips before she was captured. The *Lady Davis*, with a capacity of about four hundred and fifty bales, ran as successfully as the *Robert E. Lee*, and was, during the latter part of her career, commanded by Captain R. H. Gayle, a former navy officer. Later, the *Eugenia*, the *Stag*, and several other vessels were added. They were used at first for carrying cotton and ordnance, and finally for carrying general supplies. Other valuable steamers owned by the Bureau were the *Columbia*, the *Merrimac*, and the *Phantom*.

In order to systematize the work at the West India depots, it was deemed advisable to station responsible Confederate agents at these places to supervise the shipments. Accordingly, about mid-summer of 1862, Secretary Randolph sent Major Norman Walker to take charge at Bermuda. Later Major Walker was succeeded by an army officer, Lieutenant-Colonel Smith Stansbury. During the latter part of the war, however, Major Walker was again in charge of this post. At Nassau Mr. Louis Heyliger looked after the shipments from early in 1862 until the close of the war. A third depot was established and supervised at Havana.

As Colonel Gorgas was devoted to the work of the Ordnance Department proper it was not possible for him to give the necessary personal attention to the Bureau of Foreign Supplies. So in order to have this work effectively discharged, Lieutenant-Colonel Bayne was put in special charge of this branch of service

with headquarters in Richmond. The financial interests of the Bureau in Europe were under the general supervision of Mr. C. J. MaRae.

For the purpose of dispatch in the importation of supplies and exportation of cotton, and for the more successful operation of the Bureau, it was found necessary to supervise the procuring and shipment of cotton to Wilmington, Charleston, and other points. A steam compress was established at Wilmington for this work, while agents were sent into the interior to secure cotton and supervise its transportation. The railroads were so overtasked that it was only by placing positive orders from the Secretary of War in the hands of a selected agent that cotton could be with certainty forwarded over the various roads.<sup>185</sup>

An approximate estimate of the work of this Bureau may be made from summaries of shipments and receipts of supplies at various periods:

By December, 1862, Major Huse had purchased 157,000 small arms, large quantities of gun-powder, some artillery, infantry equipments, harness, swords, percussion-caps, saltpeter, and lead. Also, he had purchased large supplies of clothing, blankets, cloth, and shoes for the Quartermaster's Department.<sup>186</sup> Many of these supplies were held up indefinitely in Europe on account of the lack of vessels for shipment, while loss at sea and capture by the enemy prevented many more from reaching the Confederate States.

By February, 1863, the following army supplies were purchased and shipped by Major Huse for the Confederate Government:

131,129 stands of arms, of which there were 70,980 long Enfield rifles, 9,715 short Enfield rifles, 324 carbine Enfield rifles, 27,000 Austrian rifles, 21,040 British muskets, 20 smooth-bore Enfield rifles, and 2,020 Brunswick rifles.

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<sup>185</sup>Gorgas, 79-81; Huse, 22-36; Mallet, 2-3; *Off. Rec.*, Ser. IV, Vol. I, 346-347; 486-487, 493-494, 498-503, 541, 577-578, 692, 985, 1003-1005, 1007-1008, 1174-1175; *Off. Rec.*, Ser. IV, Vol. II, 536-537, 567-568, 670, 955-956; *Off. Rec.*, Ser. I, Vol. XXVI, Part II, 24, 118; *Off. Rec.*, Ser. III, Vol. I, 445.

<sup>186</sup>Gorgas to Seddon, December 5, 1862. *Off. Rec.*, Ser. IV, Vol. II, 227-228.



The total cost of the arms, including cases, molds, and screw-drivers, was £ 417,263 9s. 11d.

The artillery shipped consisted of 129 guns, of which there were: 54 six-pounder bronze guns, smooth; 18 howitzer bronze guns, smooth; 6 twelve-pounder iron guns, rifled; 2 howitzers, iron, with carriages and caissons; 6 rifled Blakely cannon, with carriages; 3 rifled eight-inch Blakely cannon; with 680 shells; 12 rifled twelve-pounder steel guns, with shot and shells; 32 Austrian bronze guns, rifled, with caissons and 10,000 shrapnel shells and fuses; 2 bronze rifled guns, with 200 shells and fuses; 756 shrapnel shell, round; 9,820 wooden fuses; 4 steel rifled, nine-pounder cannon, with 1,008 shells and fuses; 220 sets of harness; also parts of artillery harness.

The total cost of the artillery order was £ 96,746 1s. 8d.

There were 1,226 cavalry equipments, 16,178 cavalry sabers, 5,392 cavalry saber-belts, 5,392 cavalry saber-knots, 1,360 cavalry Humnals, 1,386 cavalry surcingles and pads, consisting in all £ 20,321 12s. 3d.

Fifty sets of Webb harness, and parts of harness were purchased at a cost of £ 9,717 11s., while 34,731 sets of accoutrements, 40,240 gun slings, 34,655 knapsacks, 4,000 canteen straps, 81,406 bayonet scabbards, 650 sergeants' accoutrements, were obtained for £ 54,873 16s. 3d.

As to ammunition, there was purchased: 357,000 pounds of cannon powder, 94,600 pounds of musket powder, 32,000 pounds of rifle powder, 900 pounds of blasting powder, 4,137,000 cartridges for small-arms, 2,800 pounds of chlorate potassa, 1,026 hundred-weight of saltpeter, 89,900 friction tubes, 10,100,000 percussion-caps, costing in all £ 47,010 10s. 3d.

During this same period the Bureau had purchased and shipped for the Quartermaster's Department goods costing £ 49,683, 10s. 5d.<sup>137</sup>

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<sup>137</sup>Indorsement by Gorgas, February 3, 1863. Off. Rec., Ser. IV, Vol. II, 382-384.



It has been estimated that of the 400,000 arms which were distributed to the armies during the first two years of the war, 185,000 came from abroad.<sup>138</sup> It is significant, too, to note that during the year, September 30, 1862 to September 30, 1863, the Confederate steamers, Columbia, R. E. Lee, Merrimac, Eugenie, and Phantom brought safely into port 113,504 small-arms, large quantities of salt-peter, lead, cartridges, percussion-caps, leather, hardware, and flannel and paper for cartridges. Other imports during the same period were three 8-inch rifled, and two 12 $\frac{3}{4}$ -inch iron rifled Blakely guns. The latter weighed about 55 tons, and were capable of discharging a solid shot of about 650 pounds, and a shell of 470 pounds. Two shiploads of military stores were also landed on the coast of Texas.<sup>139</sup>

During the year September 30, 1863, to September 30, 1864, the importation of arms consisted of 39,798 rifles, 1,716 pistols, and 4,740 carbines, while about 122,000 similar arms were at the West India depots awaiting shipment. The falling off of foreign supplies was due largely to lack of funds.<sup>140</sup>

No definite information is available as to the extent of importations after the above report, but the tightening of the blockade, and the continued depletion of Confederate currency must have contributed to a considerable degree in reducing the amount of ordnance received from abroad. After the fall of Fort Fisher in January, 1865, blockade running practically ceased, and the Confederacy could no longer depend upon Europe for ordnance and other supplies.

## 2. The Niter and Mining Bureau.

During the first year of the war the supply of niter, iron, lead, and other ordnance materials was insufficient. In order to remedy this deficiency Colonel Gorgas decided that the production of these materials, especially niter, must be systematically pursued. In March, 1862, he recommended to the Secretary of War the organization of a separate body of officials

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<sup>138</sup>Gorgas, 87.

<sup>139</sup>Gorgas to Seddon, November 15, 1863. *Off. Rec.*, Ser. IV, Vol. II, 955-956; Gorgas, Notes on Ordnance Department, 94.

<sup>140</sup>Gorgas to Seddon, December 31, 1864. *Off. Rec.*, Ser. IV, Vol. III, 986-988.

who would supervise the extraction of niter from the caves, and the construction of niter beds.<sup>141</sup>

Acting on the recommendation of the Chief of Ordnance, Congress passed an act, approved April 11, 1862, which authorized the President to appoint a corps of officers, which was to consist of one superintendent, with the rank, pay, and allowances of a captain of artillery, eight subordinates; with the rank, pay, and allowances of first lieutenants of artillery. These officers were to be under the supervision of the Chief of Ordnance, and their duties were to

"inaugurate and prosecute a system for the efficient working of the niter caves, and to purchase and contract for the delivery of niter produced within the limits of the Confederate States; to inspect the niter caves and other natural deposits of nitriferous earth, and to report the probable annual supply from these sources, and the extent and economy, or otherwise, with which they are now being worked by private enterprise; to establish niter beds in the vicinity of the principal cities and towns of the Confederacy, and to contract for the necessary grounds, sheds, & etc., and for the offal and other materials used in the preparation of niter beds; to diffuse information and to stimulate enterprise in the production of an article essential to the successful prosecution of the war."<sup>142</sup> The superintendent was to make reports, at stated periods, to the Chief of Ordnance, who was to submit them to the Secretary of War, for the information of Congress. The President was to use his discretion in continuing the organization.<sup>143</sup>

Major I. M. St. John was made superintendent of this branch of service, later known as the "Niter and Mining Bureau," because the securing of other materials for ordnance became the duty of this corps of officers. The selection of Major St. John was indeed fortunate. Recognizing his ability as an organizer, Colonel Gorgas placed him in full charge of the production of niter from the caves and from other sources, and of the formation of niter beds which had been started in Richmond. At Columbia, South Carolina, Savannah, Augusta, Mobile, Selma, and various other points, niter beds were formed under the

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<sup>141</sup>Gorgas to Benjamin, March 12, 1862, *Off. Rec.*, Ser., IV, Vol. I, 990.

<sup>142</sup>*Off. Rec.*, Ser. IV, Vol. I, 1054-1055.

<sup>143</sup>*Off. Rec.*, Ser. IV, Vol. I, 1054-1055.

supervision of Major St. John. By the close of 1864, there had been collected 2,800,000 cubic feet of earth in various stages of nitrification, a large proportion of which was prepared to yield one and one-half pounds of niter per cubic foot of earth. This included all the niter beds from Richmond to Florida.<sup>144</sup> When the war closed the beds were not "ripe" enough to be used, but it has been estimated that they contained at that time three or four million pounds of saltpeter.<sup>145</sup>

In addition to the formation of artificial beds, the entire niter-bearing area of the country was laid off into districts. Each of these districts was put in charge of an officer who made his monthly reports to the central office at Richmond.<sup>146</sup> By order of the War Department, military commanders and officers of the Niter Bureau were authorized to seize and impress niter and niter caves.<sup>147</sup>

Workmen for the niter caves were secured through the detailing of men who were generally subject to military duty in the mountain regions where disaffection existed. Extensive works in the mountainous districts were operated in this way, and in about a year the niter production was brought to something like half the total consumption of niter. In order to get results, however, the officers in charge of the mountainous districts, especially in East Tennessee, North Carolina, and North Alabama had to discharge their duties with much firmness in dealing with these turbulent people. In connection with the production of niter, it is curious to note that the district which could be relied upon for the most constant yield of niter had no niter caves in it. The headquarters of this district as Greensboro, North Carolina. By the lixivication of nitrous earth dug from under old houses and barns the niter was produced.<sup>148</sup>

Men for work in niter caves were also detailed by their officers holding commands in a certain district, and in the caves of the particular district in which they were stationed. Such detailing of men followed the requisition of the officers in charge of the Niter Bureau, and were organized temporarily

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<sup>144</sup>Gorgas, 76.

<sup>145</sup>Mallet, 10.

<sup>146</sup>Gorgas, 76.

<sup>147</sup>Off. Rec., Ser. IV, Vol. I, 1055, 1056-1060, 1108, 1116, 1124, 1139.

<sup>148</sup>Gorgas, 76.

under the command of the niter officer in charge of a particular cave. This officer made monthly reports to the general or other officer in command of the military forces of a department, district, or post in which the cave was located, in order that such commanding officer could treat as deserters any detailed men who would leave the works without permission. Generals and other commanding officers were urged to give such protection as their means afforded against any encroachments of the enemy upon the niter caves within the limits of their commands.<sup>149</sup>

Persons actually employed by the Niter Bureau, as contractors for the manufacture of saltpeter, or laborers, were exempt by the law from enrollment in the army. All employees, officers and men, were ordered by the War Department to be furnished by the Quartermaster's and Commissary Departments with provisions and forage as in the case of ordnance officers and men in the field. Free negroes were to be impressed by the officers of the Niter Bureau for the purpose of working in the niter caves, and were to be paid wages and furnished with subsistence.<sup>150</sup>

The above arrangements made conditions favorable for a conflict of authority between the officers of the niter corps and those in command of troops. Such a conflict arose when Captain Richard Morton of the Niter Bureau decided that it was proper to take possession of a cave in Giles County, Virginia. Following instructions, he wrote to the officer in command of the troops near the cave requesting him to make the impressment, and in order to make the requisition official, Captain Morton requested the Secretary of War to approve it. The Secretary of War, however, referred the matter to General Heth to 'see that the cave be worked to the best advantage.' Concerning this act, Captain Morton complained that it deprived the officers of the Niter Bureau of the greater part of their efficiency as an organization, that it was the duty of the agents of the Bureau to be properly informed from personal inspection of all sides of every case, and that being informed and responsible for results they would be the most suitable persons to decide the question of impressments.

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<sup>149</sup>No. R1, General Orders, War Department, May 31, 1862, *Off. Rec.*, Ser. IV, Vol. I, 1139.

<sup>150</sup>No. 41, General Orders, War Department, May 31, 1862, *Off. Rec.*, Ser. IV, Vol. I, 1139.

For the accomplishment of this end, Captain Morton made the request to Colonel Gorgas that application be made to the Secretary of War to issue an order which would direct the military authorities to impress caves upon application of the officer in charge of the operations of the Niter Bureau in each state.<sup>151</sup> The views of Captain Morton were approved by Colonel Gorgas as being just, and he requested that instructions be given to military commanders to act upon the requisitions of officers of the Niter Bureau in charge of the district.<sup>152</sup> On May 19, 1862, an order was issued from the War Department that "military officers will impress niter caves on requisition of officers of the Niter Corps."<sup>153</sup>

When Major St. John first assumed his duties he was directed by the Chief of Ordnance to give his attention first to the production of niter, next to lead, then to sulphur, and incidentally to all minerals which might prove useful to the Department. Before the organization of the Niter Bureau the Ordnance Department had directed public attention to the manufacture of niter. In Arkansas, Alabama, Georgia, East Tennessee and Western Virginia, works had been commenced, and a considerable amount of private capital had been invested when military reverses caused all but one of the important caves then operated to fall into the hands of the enemy. This cave was in Bartow County, Georgia. It was under faulty management and produced less than one-third of its capacity, while the owners of the smaller caves had become discouraged or indifferent. Under these conditions the home production of niter from all sources within the Confederate States was on May 1, 1862, less than 500 pounds per day. In order to make the best of the situation, the Bureau issued the following plan of operation which was submitted to the Department and approved:

"First, To explore rapidly, but with system, for niter caves and deposits.

Second, To stimulate private enterprise by circular and newspaper publications, personal appeal and instruction, and

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<sup>151</sup>Morton to Gorgas, May 7, 1862, *Off. Rec.*, Ser. IV, Vol. I, 1115-1116.

<sup>152</sup>Gorgas to War Department, May 9, 1862, *Off. Rec.*, Ser. IV, Vol. I, 1116.

<sup>153</sup>Special Orders, No. 114, Richmond, May 19, 1862, *Off. Rec.*, Ser. IV, Vol. I, 1124.

by affording facilities for work in prompt payment and a liberal supply of tools and utensils.

Third, When advisable, to start work on Government account.<sup>154</sup>

This plan of exploration was energetically pursued, and by August 1, 1862, the Superintendent of the Bureau could report that furnaces had been erected, and that work was under way at sixteen Government caves, with an average force of two hundred and seventy-two white hands and one hundred and fifteen negroes. The labor and production of private works could not be definitely estimated.<sup>155</sup>

The conditions necessary for a successful production of niter were: a cave containing at least five thousand cubic feet of earth, with dry nitrous earth, covering the cave floor, or filling up its chambers in crevices, and yielding one per cent or more of nitrates; or strata of limestone which formed a necessary mineral base for the accumulation of nitrous earth under plantation buildings. For the successful manufacture of niter from the natural deposits there were required potash, wood, and water within easy access. On account of the lack of these requirements, many caves could not be advantageously worked.<sup>156</sup>

A brief consideration of the work in the niter districts of the several states will show the extensive scope of the operations of this Bureau, and its accomplishments during the early part of its existence.

In Virginia, fifty contracts were made with private parties. Some were doing well, but the progress was slow, and the advances of the enemy in Greenbrier and Monroe Counties caused a number of caves to be abandoned. One Government cave was put into operation in Tazewell, one in Giles, and six in Wythe, Smyth, Pulaski, and Montgomery counties. Artificial production of niter had been commenced at Petersburg and near Rich-

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<sup>154</sup>St. John to Randolph, July 31, 1861. Off. Rec., Ser. IV, Vol. II, 26-30.

<sup>155</sup>St. John to Randolph, July 31, 1862. Off. Rec., Ser. IV, Vol. II, 26-30.

<sup>156</sup>St. John to Randolph, July 31, 1862. Off. Rec., Ser. IV, Vol. II, 26-30.

mond, the latter city affording material for at least thirty thousand pounds of niter per annum, if sufficient labor could be retained. This was almost impossible on account of interruptions of the recruiting officers. Scarcity of labor also limited the production from caves in the outlying districts, but the interruption from recruiting officers almost entirely ceased after the publication of General Orders, No. 41.

In North Carolina the work was confined mainly to the plantation earth in the tobacco and primary limestone counties, the niter caves in the western counties being few, small, and inaccessible, while the several localities which were examined for niter beds on a large scale did not have the proper facilities.

In South Carolina, there was no known niter cave, but the lower districts were favorable for niter beds. The state had begun a "nitriary" at Columbia, and the Government agents had begun another near Orangeburg.

In Georgia the Government agents had established a nitriary on the Savannah River near Augusta. Here there were unusual facilities in climate, water carriage, and the supply of both organic and inorganic materials for the operation of niter works of a permanent character upon the most improved European system. In the northwestern counties of the state were several caves, one previously mentioned in Bartow County being especially valuable. This cave had been operated under private management, then the state took preliminary measures to seize it, but on June 15, 1862, it was seized by order of the Niter Bureau and worked on Government account. When taken under the control of the Government the cave was yielding less than eighty pounds per day, but under Government management it was soon raised to four hundred pounds per working day, and would have been much higher had it not been for the interruption of potash transportation on the Georgia railroads due to the movement of General Bragg's army.

In Tennessee several large and rich caves fell into the hands of the enemy, and the supply of niter from this state was practically stopped.

The presence of the enemy in Northern Alabama caused a suspension of the work there, but two or three other caves were



operated, and plans were under way for starting more. In lower Alabama efforts were made to induce planters in the limestone and marl counties to work plantation earth, but no results were reported. Similar efforts were made in Mississippi.

In Florida it was found that small returns could be expected from the natural caves, as they were generally wet, but work on plantation earth was fairly successful.

Since the organization of the Trans-Mississippi county had been delayed, little had been done toward the production of niter. A party of three, in charge of Captain Read, had recently been selected and instructed to arrange in Texas, if practicable, a regular transportation of recruits from Mexico to examine, and, if miners could be obtained, to start lead works in Arkansas; to have work resumed in the valuable niter caves of the upper part of the state as soon as accessible; and to examine a reported valuable saline deposite near New Iberia, Louisiana.<sup>157</sup>

The results in the production of niter to July 1862, were stated as follows:<sup>158</sup>

“From April 19 to June 1 about 25,000 pounds of niter were collected and forwarded; from June 1 to July 1, 24,393 pounds, with 10,945 pounds on hand subject to order. From obvious causes, the collection of tools and materials, construction of furnaces, and the instruction of agents and foremen, work was not fairly commenced on Government caves until late in June. On the other hand the large Arkansas percentage made previous to May 1, 17,000 pounds, cannot again appear on our returns until the event of the war permit. The yield during August will probably be from 1,600 to 2,000 pounds per working day. It should have been over 2,500 pounds per day, but the prevailing anxiety to save the crops, the unwillingness to send negroes far from home and the consequent scarcity of labor, and the lamentable condition of public transportation have prevented. The last two drawbacks are receiving the earnest and anxious attention of the Bureau, and when met should raise the home niter production to 3,000 pounds per diem.”

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<sup>157</sup>St. John to Randolph, July 31, 1862. *Off. Rec.*, Ser. IV, Vol. II, 26-30.

<sup>158</sup>St. John to Randolph, July 31, 1862. *Off. Rec.*, Ser. IV, Vol. II, 29.



In supervising the mining service the Bureau had the most available lead veins surveyed and registered, and since mining labor was scarce it was deemed advisable to concentrate the small force upon the leading mines that promised the quickest results. A change of contract had doubled the yield of the Wythe lead mines in Virginia within a month, and it was expected to soon raise the output to three and one-half tons per working day. The Petersburg Smelting Works were reported to be in a good working order to desilverize the lead ore from the Wythe and Silver Hill (North Carolina) mines. Good results were reported from the Jackson mine near Jonesborough, Tennessee. Lack of labor and machinery prevented operations in Arkansas.

The total yield of lead of the Confederate mines at this time averaged three or four tons per day which was not equal to the army demand. The remainder of what was necessary was more than met by importation and by the collection of scrap lead in which the Bureau agents were very active.

Concerning copper, the mines at Ducktown, Tennessee, were reported as yielding sufficient for the present demand, while the mines in Carroll and Grayson Counties, Virginia were said to be available.

In regard to the production of sulphur, good localities were selected for sulphur works when necessary, and contracts were signed with private parties, but no returns had been made at the date of this report.

In order to systematize the supervising of the mining interests, a "mining desk" in the Bureau under charge of competent officers, was contemplated.<sup>159</sup>

The production and collection of niter from May to the end of October, 1862,<sup>160</sup> was 200,820 pounds, while 38,000 pounds were secured in Mexico and delivered east of the Mississippi. There were 120,000 cubic feet of nitrified material in niter sheds, with a rapid increase. Correct returns had not been received from

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<sup>159</sup>St. John to Randolph, July 31, 1862. *Off. Rec.*, Ser. IV, Vol. II, 29-30.

<sup>160</sup>I. M. St. John to Seddon, December 3, 1862. *Off. Rec.*, Series IV, Vol. II, 222-223. See Schwab, *op. cit.*, 271.

the several ordnance officers in Europe who were seeking niter for importation to the Confederacy. It was thought that the entire importation exceeded the home production. The daily output at home had increased from 200 pounds in April to over 2,000 pounds in October. For the work of this Bureau there were in October 1,117 white employees, a considerable number of free negroes, and about 200 slaves.

It was deemed advisable to increase the number of laborers during the winter because there would be more demand for powder, that on account of the inclement weather the home production would decrease, and that the importations would probably decrease.

Also the incursions of the enemy had destroyed several establishments. To meet these conditions, Major St. John suggested that the workmen be organized to guard their own works, and to press production from domestic sources in the interior districts, and that there be more conscription of labor.<sup>161</sup>

Major St. John complained that the operations of his Bureau had, previous to the issue of General Orders, No. 66,<sup>162</sup> been impaired by the forcible taking from the niter works employees who were then required to serve in the armies.<sup>163</sup> In this action Major St. John was upheld by Colonel Gorgas who further complained that an officer of the Subsistence Department in North Carolina undertook to give niter contracts to his neighbor without any authority. Such unauthorized action was corrected, but some odium was cast upon the corps of niter officers.<sup>164</sup>

As the work of the officers of the niter corps expanded to include not only the production of niter, but that of iron, lead, copper, and other minerals, a change in the organization was affected by an act of Congress of April 22, 1862.<sup>165</sup> Under the act of April 11, 1862, the corps of officers engaged in super-

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<sup>161</sup>St. John to Seddon, December 3, 1862. *Off. Rec.*, Ser. IV, Vol. II, 222-223.

<sup>162</sup>General Orders, No. 66, October 12, 1862. *Off. Rec.*, Ser. IV, Vol. II, 83.

<sup>163</sup>St. John to Seddon, December 3, 1862. *Off. Rec.*, Ser. IV, Vol. II, 223-224.

<sup>164</sup>*Off. Rec.*, Ser. IV, Vol. II, 224.

<sup>165</sup>*Off. Rec.*, Ser. IV, Vol. II, 594.

vising the production of niter were under the general supervision of the chief of ordnance, the organization being a branch of the Ordnance Department, and known as the Niter Bureau. But under the act of April 22, 1863, it was detached from the Ordnance Department and made a separate bureau of the War Department, and was entitled, "The Niter and Mining Bureau."

This bureau was to have charge of all duties and expenditures connected with the mining of iron, copper, lead, coal, and other minerals, "so far as it shall be deemed necessary to supply the military necessities of the country," and the superintendent, with the approval of the secretary of navy was empowered to make leases, contracts and purchases of minerals required for the prosecution of the war.<sup>106</sup>

General Orders No. 85<sup>107</sup> published this act, and in addition certain regulations adopted by the War Department under the provisions of the act. Iron, so necessary for the repair of railroads, the manufacture of arms, munitions, and materials of war, could not be obtained in sufficient quantities by purchase. In order to obtain an adequate supply of iron, impressments were deemed necessary, and such impressments were to be made by the chiefs of the Quartermaster's, Ordnance, Engineer, and Niter and Mining Bureaus, or by officers designated by them. These officers were to communicate to the owner the necessity for the use of the property, the disposition of the officers to purchase, and, if the contracting parties could not agree as to the price or refusal to sell, then a price was to be fixed in accordance with the act relating to impressments. The War Department, acting under the impressment acts, authorized the officers of the Niter and Mining Bureau to seize niter from private individuals who would decline to sell it, or who would ask more than 50 cents per pound. It was further ordered that the chiefs of the aforesaid departments were to lease, purchase, or impress the product of any mine or factory and require the operation of the same for the sole benefit of the Confederate Government.<sup>108</sup>

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<sup>106</sup>Off. Rec., Ser. IV, Vol. II, 594.

<sup>107</sup>General Orders, No. 85, June 16, 1863. Off. Rec., Ser. IV, Vol. II, 594-595.

<sup>108</sup>General Orders, No. 85, June 16, 1863. Off. Rec., Ser. IV, Vol. II, 594-595.

As the work of the Niter and Mining Bureau had been hampered by the enlisting of some and the pressing of many of the other employees into military service, the War Department ordered that applications from officers of the Niter and Mining Corps for field service would not be considered, that workmen employed by the Bureau might be organized and armed for local defense on condition that military orders be subordinated to work, that military commanders extend to the Niter and Mining service, especially in districts exposed to the enemy, protection, aid, and encouragement, and that special attention be given to General Orders, No. 32, series 1863, which forbade interference with the workmen or employees at mines, furnaces, or niter works which were worked by the Government or by contractors.<sup>169</sup>

Colonel St. John manifested a disposition to co-operate in the recruiting of men by directing his officers not only to carry out the above order, but to aid in the enrolling of men for the armies. This was to be done by enrolling such employees of the Bureau as could be spared. Negro labor, and men unfit for field service were to replace these men, while clerical work was to be performed by women. In these arrangements, there was to be an increase in the output of material. Special credit was awarded where this was done by substituted labor.<sup>170</sup>

October 1, 1864, Colonel St. John reported that the more important requisitions of the army for niter, and the metal and mineral products had been promptly met; and for the navy all requisitions of niter and nearly all in the metals and coal were met. On account of the loss of important iron works, the secretary of the navy on several occasions waived his own requisitions.

The home production of niter as reported as more favorable than expected. The increased results from the better training of workmen more than offset the losses from acts of the enemy. In the preparation for artificial production much progress was being made, as special attention had been given

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<sup>169</sup>General Orders, No. 18, February 9, 1864. *Off. Rec.*, Ser. IV, Vol. III, 94-95.

<sup>170</sup>Colonel St. John to Captain William Gabbett, March 5, 1864. *Off. Rec.*, Ser. IV, Vol. III, 195-196.

for enriching and preparing the earth for results. It was the aim of the Bureau to work to the last the natural deposits—at times within the enemy's lines and to examine for new deposits.

At this time the entire force employed in the Government niter and mining service east of the Mississippi consisted of 4,041 whites from eighteen to forty-five, 365 whites over forty-five or disabled, and 5,705 negroes.

To meet the demands for the year 1865, an additional labor supply as needed.<sup>171</sup>

The production of niter previous to September 30, 1864, was reported at 1,735,531 $\frac{3}{4}$  pounds, while the amount imported was 1,720,072 pounds, or a total of 3,455,603 $\frac{3}{4}$  pounds.<sup>172</sup>

The organization of niter and mining employees for military service proved successful. Fighting on their own ground, the men gave a good account of themselves. In the battle at Mount Hope, two hundred of these men under their superintendent, Major James F. Jones, fought well in the line of battle and suffered a loss of nine killed and sixteen wounded. Men from three of the Virginia districts fought at Saltville, while the Tennessee force served for several weeks under General Vaughn. In North Alabama the men under Captain William Gabbett frequently left their work to resist the invaders.<sup>173</sup>

The efficiency of the Bureau was severely crippled by General Orders, No. 82 of October 20, 1864, which required the chief of the Niter and Mining Bureau to turn over for army service one-fifth of the able-bodied men employed in iron, lead, copper, and coal mining, and in all services connected with this work.<sup>174</sup>

In regard to the quantity of iron produced, the returns for the years 1863 and 1864 amounted to 19,538.6 tons (long) of pig-iron; 1,133 tons (short) of "bloom" iron; 4,879.6 tons (short) of rolled iron; 456.2 tons (short) of hammered iron; 7.4 tons

<sup>171</sup>St. John to Seddon, October 1, 1864. *Off. Rec.*, Ser. IV, Vol. III, 695-697.

<sup>172</sup>*Off. Rec.*, Ser. IV, Vol. III, 698.

<sup>173</sup>St. John to Seddon, October 1, 1864. *Off. Rec.*, Ser. IV, Vol. III, 697.

<sup>174</sup>General Orders, No. 82, October 20, 1864. *Off. Rec.*, Ser. IV, Vol. III, 741.

(short) of skelp iron; 1,076.2 tons (long) of scrap iron. It has not been possible to obtain definite information as to the amount of iron necessary for the needs of the Confederate armies, but it is recognized that the supply fell far short of the needs of the army, the navy, and the railroads.

The copper production to January 1, 1865 amounted to 746,805 pounds, taken chiefly from the Ducktown (Tenn.) mines; 5,336 pounds being collections of scrap copper during the previous quarter, while 31,208.7 pounds were imported, making a total of 828,349.7 pounds.

The lead returns consisted of 226,360 from the Wytheville (Va.) mines during the last quarter, 1,610,264 from the Wytheville mines and Silver Hill (N. C.) Mine, previously, or a total of 1,836,624 pounds. In the Trans-Mississippi Department the returns in pig-lead, scrap, Mexican and Arkansas lead to September 30, 1865, amounted to 390,587, while the scrap lead collected amounted to 658,320. The total amount produced in the Confederate States as 2,885,513 pounds. 18,353 pigs and 7,450 bars of lead were imported. The pigs averaged 100 pounds, and the bars 10 pounds each, making the total imported 1,909,800 pounds, and the amount of lead in the Confederacy 4,795,331 pounds.

The operation of a zinc furnace at Petersburg was suspended on account of the nearness of the enemy, but the collection of scrap zinc was conducted throughout the country. The zinc works in North Carolina were to be put in operation as soon as the weather would moderate.

In regard to sulphur, the supply was still holding out, but to guard against fire and other contingencies, sulphur furnaces were established, and preparations were made to bring the production up to 20,000 pounds per month.

At Charlotte, North Carolina, sulphuric acid chambers were in operation yielding an average of from 4,000 to 5,000 pounds per month.<sup>175</sup>

Near the close of the war the Niter and Mining Bureau was very weak because most of the able-bodied men had been conscripted into the army.<sup>176</sup>

<sup>175</sup>Morton to Seddon, December 31, 1864. *Off. Rec.*, Ser. IV, Vol. III, 988-991. Gorgas, 77.

<sup>176</sup>*Off. Rec.*, Ser. IV, Vol. III, 1164-1165. Gorgas, 76-77.

## CHAPTER V

## SUCCESS OF THE ORDNANCE DEPARTMENT

The accomplishments of the Ordnance Department may be estimated through a consideration of its work from a twofold point of view. In the first place, did it in spite of the handicaps which beset it, develop an efficient organization, one which could make the most of the meager resources of the South? Second, did it adequately supply the armies with ordnance?

As an organization for the production of war materials, the Ordnance Department was, indeed, successful. When Major Gorgas assumed his duties as Chief of Ordnance early in April, 1861, the men of the South were already flocking to the colors, and ordnance was needed at once. The tragedy of the situation was that the South had neither the factories nor the skilled workmen with which to produce the immense quantities of necessary supplies. Then, too, the raw materials were scarce and difficult to obtain. In short, the task which confronted Gorgas was that of establishing a huge industrial system in an agricultural country.

In performing the task before him, Gorgas from the first displayed remarkable ability as an organizer. This he manifested in the selection of able subordinates. The most prominent of these were: Lieutenant Colonels I. H. Burton, Superintendent of Armories; T. L. Bayne, in charge of the Bureau of Foreign Supplies; I. M. St. John, the head of the Niter and Mining Bureau; J. W. Mallet, Superintendent of Laboratories; G. W. Rains, in charge of the Augusta Powder Mills; LeRoy Broun, in command of the Richmond Arsenal; B. G. Baldwin, Chief of Ordnance of the Army of Northern Virginia, while others of almost equal distinction could be named.

The fact that General Gorgas' subordinates remained at their posts throughout the war is indicative of the harmony which prevailed in his department. Colonel Mallet, writing almost a half century after the war, said of his former chief:

"His difficult task was performed with great ability. Obstacles that could be overcome were resolutely faced with intelligent energy, and insuperable difficulties and hinderances



were borne with uncomplaining patience. Out of confusion his organizing skill brought such order as was possible. He was firm and at the same time most kindly and encouraging in his relations with all his subordinate officers. Never bouyant, he never gave way to depression. By his personal example and by the tone of his orders and correspondence, he spread about him the spirit of hearty performance of present duty, regardless of self, but in ever present mindfulness that it was duty."<sup>177</sup>

President Davis spoke very highly of the great service which General Gorgas rendered for the Confederacy and esteemed him most highly as the following will testify:

"The chief of ordnance was General J. Gorgas, a man remarkable for his scientific attainment, for the highest administrative capacity and moral purity, all crowned by zeal and fidelity to his trust, in which he achieved results greatly disproportioned to the means at his command."<sup>178</sup>

Of the importance and responsibility of the Chief or Ordnance, General Bragg, in writing of General Gorgas in 1868, said: "In our then condition (1861) his was the most important, scientific and administrative position in the Government. We were destitute of arms and munitions and had not a single manufactory of either within the limits of our country. It is sufficient to say that his patient industry, high scientific attainments and great administrative capacity soon placed us above want."<sup>179</sup>

When Gorgas was appointed Chief of Ordnance he was given the rank of lieutenant-colonel, but by the close of the war his rank was that of brigadier-general.

So energetically and effectively did the ordnance officers perform their work that by the close of the second year of the war a chain of arsenals, armories and laboratories stretched from Virginia to Alabama, while the securing of raw materials was successfully pursued.

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<sup>177</sup>Mallet, 16-17.

<sup>178</sup>Davis, I, 481; So. Hist. Soc. Papers, XIII, 223.

<sup>179</sup>So. Hist. Soc. Papers, XIII, 228.

During this time, however, the Bureau of Foreign supplies furnished by far the greater part of the war materials. Without the aid of this branch of service Richmond would probably have succumbed to McClellan in the summer of 1862.

During the first two years of the war, the armies were greatly hampered on account of lack of arms, artillery, powder and equipments. These short-comings were due (1) to the fact that ordnance was not available, and (2) to poor transportation facilities. It was on account of the inferior railroads and other means of transportation that sufficient ammunition and arms were not in the hands of the men during the latter part of the war. The aggressive campaigns, those of Lee into Maryland in 1862, and into Pennsylvania in 1863, and of Bragg into Kentucky in 1862—were probably interfered with on account of scarcity of powder. In all three instances the lack of powder was due to poor transportation.<sup>180</sup>

It is difficult to estimate the effect of the lack of arms upon the military operations during the first half of the war. The defeat of the Federals at Manassas might have been more complete, and Washington might have been captured had the Confederate forces been provided with better arms, artillery and ammunition. The fall of New Orleans in the spring of 1862 was due largely to an inadequate supply and poor quality of artillery and ammunition.<sup>181</sup>

During the year 1861 and spring of 1862, many troops in the various armies were without arms. The following telegram is an eloquent illustration of many similar situations: "I have 4,000 unarmed men in the regiments."<sup>182</sup> Then, too, it frequently occurred that men returned home when no arms were available.

During the last two years of the war, the Ordnance Department had, with rare exceptions, sufficient arms and muni-

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<sup>180</sup>For difficulties in transportation, see *Off. Rec.*, Ser. I, Vol. XXVI, Part II, 391; *Off. Rec.*, Ser. I, Vol. XXII, Part II, 1067; *Off. Rec.*, Ser. I, Vol. XX, 922; *Off. Rec.*, Ser. I, Vol. XVI, Part II, 934; *Off. Rec.*, Ser. I, Vol. V, 832.

<sup>181</sup>See Proceedings of the Court of Inquiry upon the fall of New Orleans, *Off. Rec.*, Ser. I, Vol. VI, 555-615.

<sup>182</sup>Kirby Smith to Gorgas, June 5, 1862. *Off. Rec.*, Ser. I, Vol. X, Part II, 590.

tions on hand to meet the requisitions. The few instances in which the armies were not adequately supplied was on account of poor management and lack of facilities for transportation whereby supplies were delayed or never reached their destination. In the spring of 1865 it was due to inadequate means of transportation that Lee's army was brought not only to the point of starvation, but was deprived of necessary ordnance material.

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